

No.

200300170



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Texas Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

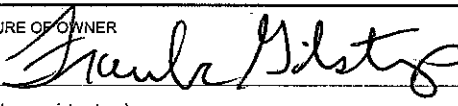
NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR OTHER VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Texas Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME Tx977053		3. VARIETY NAME Tamrun OL 02	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) Dr. Frank E. Gilstrap Associate Agency Director 2147 TAMU College Station, TX 77843-2147		5. TELEPHONE (include area code) 979-845-4747		FOR OFFICIAL USE ONLY PVPO NUMBER 200300170	
		6. FAX (include area code) 979-458-4765		FILING DATE February 25, 2003	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) State of Texas Research Agency		8. IF INCORPORATED, GIVE STATE OF INCORPORATION		9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Janie Hurley Technology Licensing Manager, Agriculture/Life Sciences Technology Licensing Office The Texas A&M University System 3369 TAMU College Station, TX 77843-3369				FILING AND EXAMINATION FEES: \$ 3,652.00 DATE 2/25/03 CERTIFICATION FEE: \$ 432.00 DATE 10/27/04	
11. TELEPHONE (Include area code) 979-847-8682		12. FAX (Include area code) 979-845-1402		13. E-MAIL jhurley@tamu.edu	
14. CROP KIND (Common Name) Peanut		15. GENUS AND SPECIES NAME OF CROP Arachis hypogaea L. subsp. hypogaea var. hypogaea		16. FAMILY NAME (Botanical) Leguminosae	
17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)			
19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input checked="" type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input type="checkbox"/> NO (If "no", go to item 22)		20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? IF YES, WHICH CLASSES? <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED			
21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? IF YES, SPECIFY THE <input checked="" type="checkbox"/> FOUNDATION <input checked="" type="checkbox"/> REGISTERED <input checked="" type="checkbox"/> CERTIFIED NUMBER 1,2,3, etc. (If additional explanation is necessary, please use the space indicated on the reverse.)		22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			
23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF OWNER 		SIGNATURE OF OWNER			
NAME (Please print or type) Frank E. Gilstrap		NAME (Please print or type)			
CAPACITY OR TITLE Associate Agency Director, TAES		DATE 2/14/03		CAPACITY OR TITLE	
				DATE	

INSTRUCTIONS

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be received in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the sense that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$2,705 (\$320 filing fee and \$2,385 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$320 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvp.htm>

ITEM

- 18a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
(2) the details of subsequent stages of selection and multiplication;
(3) evidence of uniformity and stability; and
(4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See *Regulations and Rules of Practice, Section 97.103*).
22. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
23. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

21. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

~~22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)~~

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

A component of this variety is protected, per a license agreement with the University of Florida Research Foundation; U.S. Patent Nos. 5,922,390; 6,063,984; 6,121,472.

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, Room 213, Building 306, Beltsville Agricultural Research Center--East, Beltsville, MD 20705.

Telephone: (301) 504-8089. <http://www.ams.usda.gov/lsg/seed.htm>

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 3.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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S&T-470 (07-01) designed by the Plant Variety Protection Office with WordPerfect 9.0. Replaces STD-470 (04-01) which is obsolete.

Exhibit A.

ORIGIN AND BREEDING HISTORY OF 'TAMRUN OL 02'

'Tamrun OL 02,' tested under experimental number Tx977053, was derived from a backcross between Tx896100 and 'Sun Oleic 95R' that was made at College Station, Texas in 1996. Tx896100 was later released as 'Tamrun 96' because it had excellent yield potential under heavy Tomato Spotted Wilt Virus (TSWV) pressure and had reduced incidence of pod rot and southern blight. Since the release of Tamrun 96 it has become widely grown in areas of Sclerotinia blight infection because of its ability to yield under moderate sclerotinia disease pressure. The disease resistance and yield potential of Tamrun 96 were the traits that attracted the TAMU Breeding Program to initially choose this line as the recurrent parent in introducing the much sought after high O/L^{1/} trait.

The BC₁F₁ seed were grown in the summer of 1996 in a field near Bryan, Texas. The BC₁F₂ generation was space planted in a winter nursery during 1996-97 in Puerto Rico in an attempt to accelerate the program and meet the industry's demand for quick high O/L variety development. Individual BC₁F₂ progeny were harvested and grown as BC₁F_{2.3} plant rows in a TSWV screening nursery near Pearsall, Texas in 1997. Plant rows were selected based on disease ratings and agronomic traits. The selected lines were grown in 1998 and 1999 in two preliminary F_{2.4} and F_{2.5} yield trials at Pearsall. Selections were made based on disease ratings, yield, and grade characteristics. Individual seeds from the 2000 BC₁F_{2.6} yield tests were tested for O/L value and then bulked and planted as BC₁F_{2.7} breeder seed increase. From this increase, BC₁F_{2.8} individual seeds were again tested for high O/L and any seeds testing less than 18:1 O/L were discarded. The remaining seed were increased and are being grown for a second breeder seed increase. The material being released is BC₁F_{2.8} generation.

The variety 'Tamrun OL02' has been observed for 8 generations since selection, and is stable and uniform, except for variants in pod type; up to 0.05 % in a sample may be variant, with three seeded pods, not two seeded. This variant is commercially acceptable and predictable.

^{1/}It has been determined that a high oleic acid to linoleic acid ratio (O/L) in peanut (and other crops) imparts desirable traits into the peanut (and other crops) after it is roasted. Desirable attributes include longer shelf life of products, including peanut butter, peanut candies, and roasted peanuts in and out of the shell. Also, there are definite health benefits from eating such products, i.e., more mono- and poly-unsaturated fat in the diet. Two dominant genes reportedly control the trait but our research has shown there may be some modifiers involved, at least in the Spanish types (Lopez et al., 2000).

Exhibit B.

STATEMENT OF DISTINCTIVENESS OF 'TAMRUN OL 02'

'Tamrun OL 02' is a runner market-type peanut (*Arachis hypogaea* L. subsp. *hypogaea* var. *hypogaea*) cultivar with a high O/L ratio and good yield potential. The new variety was tested as Tx977053. Tx977053 is a sister line to Tamrun OL01 (Tx977006) but it has a smaller seed that is more typical of currently grown runner cultivars such as Tamrun 96. Tx977053 also has lower sugar content than Tamrun OL01. The objective in releasing Tx977053 is to provide the peanut growers of Texas, and especially West Texas, a runner variety which has high O/L and some ability to withstand effects of soil borne diseases and tomato spotted wilt virus, but with a smaller seed size and lower sugar content than Tamrun OL01.

'Tamrun OL 02' is most similar to Florunner and Tamrun 96; however, Florunner and Tamrun 96 have smaller size seed weight per 100 sd. (Florunner = 59.8 g/100, Tamrun 96 = 60.5, vs. Tamrun OL 02 = 64.7 g/100), lower oleic acid: linoleic acid ratios (Florunner = 1.4:1, Tamrun 96 = 1.5:1, vs. Tamrun OL 02 = 19.1:1), and higher Iodine values (Florunner = 96.6, Tamrun 96 = 97.2, vs. Tamrun OL 02 = 76.8), than 'Tamrun OL 02.' More information is provided below.

Plant description: The plants of Tx977053 are profusely branched at or near the cotyledonary nodes at the base of the plant, like Florunner and Tamrun 96. Tx977053 is a larger growing plant than Florunner and Tamrun 96. Main stem height averaged 43.6 cm at three locations for Tx977053 (**Table A**), significantly taller than Florunner at 37.6 cm, Tamrun 96 at 31.5 cm and 29.4 cm for Tamrun OL 01. This difference is obvious in field plantings when the four lines are growing adjacent to one another, but less noticeable in a field of Tx977053. Lateral branch length for Tx977053 averaged longer than for Florunner (61.6 cm vs. 55.4 cm), but was not statistically significant (DMRT, 0.05). See **Table A and Appendix I** for plant measurement analyses. The plant color appears to be a darker green than Florunner (Tx977053 color is 146A, according to the Royal Horticultural Society color chart).

Leaf measurements show that the leaflets of Tx977053 are significantly longer and wider than those of Florunner, Tamrun 96, and Tamrun OL 01. (**Table A and Appendix I**).

Pod and seed description: The pods and seed of Tx977053 are significantly smaller than Tamrun OL 01 (**Table B and Appendix II**). Where the pods of Tamrun OL 01 will almost always grade 40% or more Fancy (Grade as a Virginia), Tx977053 rarely will grade as a Virginia type. Seed size for Tx977053 averaged 64.7 g/100 sd., whereas seed size for Florunner averaged 59.8 g/100 sd. Although Tx977053 is larger than Florunner and Tamrun 96 (**Table B and Appendix II**) shelling data show that the line partitions about equal in jumbo and medium sizes (**Appendix III**). Pod length for TX977053 was 31.4 mm and width = 11.8 mm. This is smaller than Tamrun OL 01 at 33.6 mm long and 13.2 mm wide. The Tx977053 pods are longer than Florunner (31.4 mm vs. 28.6 mm) but are equal in other measurements. The same is true for Tx977053 vs. Tamrun 96. The pods are moderately reticulated, like Florunner, Tamrun 96, and Tamrun OL01, but have a slightly more prominent beak than Florunner, like Tamrun 96 and Tamrun OL 01. Pods are mostly two seeded, with variant three seeded pods occurring at a rate of up to 0.05 % in a sample. The constriction between the two pod segments is moderate, but more pronounced than Florunner and Tamrun 96, although not significant statistically (**data in Table B**).

Seed of Tx977053 are smaller than Tamrun OL 01 in most respects, but measure to be wider than Tamrun OL 01 in the apical position, giving the apical seed a flat appearance, like Tamrun 96. The 100 seed weights (**Table 1**) reflect the smaller size (than Tamrun OL 01) but also emphasize that Tx977053 pods and seed are larger size than Florunner and Tamrun 96.

Chemical and Organoleptic evaluation: Quality analyses indicated significant differences between Tx977053 and Florunner in traits such as O/L ratio = 19.1:1, and Iodine number = 76.8, with oil content = 49.55 %, and protein content = 25.99 %, about equal to Florunner. The chemical analyses of this line are of primary importance in our decision to submit the line for release. The oleic acid: linoleic acid ratio of this line averaged 19.1:1 in the 2001 tests from three locations: Frio County, Erath County, and Gaines County, Texas (see **Table D-2**). The Leek company analyses gave us an average O/L for all samples run of 18.55. If the line is 15:1 O/L range, or above, in West Texas it will be acceptable because industry personnel (Hershey, M&M Mars, and others) assure us that if the O/L for a peanut as high as 15:1, other parts of the product (i.e., candy bar) will break down before the peanut oxidizes and takes on a bad flavor.

Note: The oleic acid is the acid designated as 18.1 in the table in Appendix III. Linoleic acid is the 18.2.

The 19.1:1 ratio of Tx977053 compares to a 1.4:1 for Florunner at the same locations, and 1.5:1 for Tamrun 96 (**Table D-2**). Actual percentages of oleic and linoleic acids are shown in **Appendix III**. These chemical and organoleptic evaluations were conducted by either the Leek Company, or the USDA lab in Raleigh, NC, or in our labs in College Station, Texas and Lubbock. The chemical tests done by the Leek Company were run in the Brownfield, TX lab and/or in the Pert Labs Division of Leek in Edenton, NC.

In other chemical analyses (**Appendix III**) Tx977053 was higher than Tamrun 96 and Tamrun OL 01 in oil percent (Tx977053 = 49.55; Tamrun 96 = 47.04; Tamrun OL 01 = 47.38) but equal to Florunner (Flo. = 50.5). In protein percent Tx977053 was essentially equal to Florunner, Tamrun 96, and Tamrun OL 01; (Tx977053 = 25.99; Florunner = 25.85; Tamrun 96 = 25.75; and Tamrun OL 01 = 25.16). The Iodine value (a measure of the oxidative properties of the oil which pertains to the shelf life of roasted product) of the Tx977053 is much better than Tamrun 96 and Florunner (Tx977053 = 76.8; Tamrun 96 = 97.2; Flo. = 96.6). Readings below 92 are desirable, and below 85 are considered exceptional in oxidative properties. We expected this in Tx977053 because Iodine number is directly related to the O/L ratio.

The sugar content of Tx977053 is another very important aspect of the decision to apply for release of this line. Tamrun OL01 has a slightly higher sugar content than Tx977053 and, thus, causes manufacturers difficulty in roasting the peanut. Tx977053 is lower in sugar content than Tamrun OL01, as well as Flavor Runner 458 (**Table E**). This character will make the line even more desirable for growers and users alike. Additional sugar content data are shown in **Appendix III**, verifying our findings.

Taste panel evaluations were very positive for the Tx977053 line. The characters evaluated included Roasted Peanuty, Sweet Aromatic, Sweet Taste, Raw Beany Green, Dark Roast, and Woody Hull Skins. Also measured was Bitterness and Astringency. The industry definitions of these characters are shown in Appendix III. Averages for these characters were all within the acceptable range for Tx977053. Analyses and exact figures for these taste tests are shown in **Appendix III**.

Shelling properties: **Figures 1 and 2 (in Appendix III)** show the relative shelling properties of Tx977053, Florunner, Tamrun 96, and Tamrun OL 01, indicating that the Tx977053 line is very similar to the Florunner and Tamrun 96 lines, and that these three have a very different turnout of Jumbo, Medium, No. 1's, -16 (less than 16, called other kernels), and splits than does Tamrun OL 01. From Figures 1, Figure 2, and Table 1 we see that all the characters measured in shelling were different from Tamrun OL 01, including the percent of Jumbo kernels which is significantly higher (see **Appendix III**) for Tamrun OL 01 than for Tx977053, Florunner, and Tamrun 96. Supportive shelling properties data are shown in **Appendix III**.

In measurements of bulk density of the pods of our samples, Tx977053 was in the same range as Tamrun 96 and Florunner. These measurements relate to storage properties of the line. Supportive data are shown in **Appendix III**.

For Exhibit B

200300170

Table D-2: Oleic/linoleic acid ratios and percentages

Analyses of samples from the 2001 test year

Three locations: Frio County in South Texas
 Erath County in Central Texas
 Gaines County in West Texas

	<u>Tamrun OL02</u>	<u>Tamrun 96</u>	<u>Florunner</u>
Frio County	19.8* (79.3:4.0)**	1.7 (50.3:29.4)	1.6 (48.8:31.1)
Erath County	18.0 (79.7:4.0)	1.4 (46.6:33.3)	1.3 (44.7:35.4)
Gaines County	19.5 (80.1:4.1)	1.4 (45.9:33.3)	1.4 (47.5:32.9)
Variety mean for O/L	19.1	1.5	1.4

*O/L ratio shown first (i.e., 19.8 to 1, oleic to linoleic acid ratio)

** Percent of oleic acid and percent linoleic acid shown in parenthesis

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
~~LIVESTOCK, POULTRY, GRAIN & SEED DIVISION~~
BELTSVILLE, MARYLAND 20705

OBJECTIVE DESCRIPTION OF VARIETY

PEANUT (*Arachis hypogaea*) subsp. *hypogaea* var. *hypogaea*

NAME OF APPLICANT(S)

Texas Agricultural Experiment Station

VARIETY NAME OR TEMPORARY DESIGNATION

ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code)

1229 North US Hwy 281 Williams Administration Bldg
Stephenville, TX 76401 Texas A&M University
College Station, TX 77843

Tx 977053

FOR OFFICIAL USE ONLY

PVPO NUMBER

200300170

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g., or) when number is either 99 or less or 9 or less.

1. BOTANICAL TYPE:

Flowering on the Main Stem: 1 = ABSENT 2 = PRESENT

Branching Pattern: 1 = ALTERNATE - Pairs of vegetative & reproductive branches (Virginia) 3 = OTHER (Specify) Alternate but not perfectly so.
2 = SEQUENTIAL - Continuous reproductive branches (Valencia-Spanish)

2. PLANT:

Habit: 1 = PROSTRATE (Florunner) 2 = DECUMBENT (NC-5) Branching: 1 = SPARSE (Valencia) 2 = MODERATE (Starr)
3 = SEMI-ERECT (Floripan) 4 = ERECT (Starr) 3 = PROFUSE (Florunner)

3. MATURITY:

Region: 1 = VIRGINIA, NORTH CAROLINA 2 = S.E. UNITED STATES 3 = S.W. UNITED STATES 4 = OTHER

NUMBER OF DAYS TO MATURITY

NO. OF DAYS EARLIER THAN 1 = STARR 2 = FLORUNNER 3 = FLORIGIANT
4 = VIRGINIA 61R 5 = NC-2
 NO. OF DAYS LATER THAN 6 = NC-5 7 = SOUTHEASTERN RUNNER 56-15
8 = OTHER (Specify) Tamrun 96

4. LEAVES:

COLOR AT 60 DAYS: (Nickerson Color Designation): 1 = LIGHT GREEN (10Gy 6/9) 2 = MEDIUM GREEN (2.5G 5/9)
3 = DARK GREEN (5G 4/7) 4 = OTHER (Specify) 146A RHS chart

MM. LEAFLET LENGTH (Basal leaflet of the youngest fully opened leaf)

LEAFLET LENGTH/WIDTH RATIO

5. POD: (Average for 20 pods at maturity)

MM. LENGTH

MM. DIAMETER

KG./HA. POD YIELD

% LESS THAN 1 = STARR 2 = FLORUNNER 3 = FLORIGIANT
4 = VIRGINIA 61R 5 = NC-2

% MORE THAN 6 = NC-5 7 = SOUTHEASTERN RUNNER 56-15
8 = OTHER (Specify) Tamrun OL01

% FANCY SIZE: (% riding 13.46 mm., 34/64 inch, spacing set on presizer roller)

5. POD (Average for 20 pods at maturity):

- 2 NUMBER OF SEEDS PER POD: 1 = 1 2 = 2 3 = 3 4 = 3-4 5 = 2-3-4
- 2 CONSTRICTION: 1 = SHALLOW OR NONE (*Virginia 56R, Argentine*) 2 = MEDIUM (*Virginia 61R*) 3 = DEEP (*Starr*)
- 1 SURFACE: 1 = GLABROUS (*Florunner*) 2 = PUBESCENT (*Florissant*)
- 2 BEAK: 1 = ABSENT 2 = INCONSPICUOUS 3 = PRONOUNCED

6. SEED (Mature, cured but not aged):

- 0 3 COAT COLOR: 1 = WHITE (*Pearl*) 2 = CREAM 3 = TAN (*Starr*) 4 = BROWN 5 = PINK (*Florissant*)
6 = RED 7 = PURPLE 8 = DARK PURPLE 9 = VARIGATED
10 = OTHER (*Specify*) _____
- 2 COAT SURFACE: 1 = SMOOTH 2 = INDENTED 2 1 = UNIFORM COLOR 2 = BLEMISHED
1 = SPHEROIDAL (*Starr*) 2 = SHORT-BROAD (*Florunner*) 3 = ELONGATED-SLENDER (*Dixie Runner*)
- 3 SHAPE: 4 = CYLINDRICAL-TAPERED ENDS 5 = CYLINDRICAL-BLUNT ENDS (*NC-2*) 6 = OTHER (*Specify*) _____
- 1 6 MM. LENGTH 0 9 MM. WIDTH 6 4 GRAMS PER 100 SEED (8% Moisture)

7. DISEASE RESISTANCE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- 1 SOUTHERN STEM ROT 1 RUST
- 1 EARLY LEAF SPOT 0 VIRUS X
- 1 SOUTHERN LEAF SPOT 0 MOSAIC
- 1 POD ROT COMPLEX 0 OTHER (*Specify*) _____

8. INSECT RESISTANCE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

- 1 THRIPS 0 BURROWING BUG
- 1 LEAF HOPPER 1 NEMATODE (*Specify species*)
- 0 SOUTHERN CORN ROOTWORM 1 LESSER CORNSTALK BORER
- 0 APHID 1 OTHER (*Specify*) *Sclerotinia blight*
ran 9/23/04

9. COMPARISON OF SUBMITTED VARIETY WITH ONE OR MORE SIMILAR VARIETIES:

VARIETY	OIL* (%)	PROTEIN* (%)	OLEIC: * LINOLEIC ACID RATIO	IODINE* NUMBER	SHELLING (%)	SMK** (%)	ELK+ (%)	MAIN STEM HEIGHT (CM)
SUBMITTED	49.5	28.04	29.0	76.8	72.9	68.2	21	43.6
SIMILAR	47.4	27.68	28.8	76.0	75.6	71.0	19	37.6
NAME OF SIMILAR VARIETY	TamrunOL01	Florunner	SunOleic95R	SunOleic95R	Florun.	Floru.	Flor.	Florunner

* From Sound Mature Kernels

** Sound Mature Kernels

+ Extra Large Kernels

10. INDICATE A VARIETY WHICH MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	VARIETY	CHARACTER	VARIETY
POD COLOR	Florunner	SEEDLING VIGOR	Tamrun 96
SEED DORMANCY	Florunner	HULL THICKNESS	Tamrun 96
SEED SIZE	Tamrun 96	LEAF COLOR	Tamrun 96

11. COMMENTS (Additional description or clarification - Such as: Relative disease reactions may be compared with standard varieties)

Exhibit D.

ADDITIONAL DESCRIPTION OF 'TAMRUN OL 02'

Yield, Grade and Value per acre:

Tx977053 has been yield tested under non-disease conditions, TSWV infection, sclerotinia blight (*Sclerotinia minor* Jagger) infection and other diseases in several areas of Texas and in two research locations in Oklahoma. In 21 tests in Texas and Oklahoma, 1998 – 2001, Tx977053 averaged 10% higher pod yield (Table 1) than Florunner. These 21 tests were all three or four rep. tests with two-row plots, 10 to 15 feet long; 20 entries per test. The only major acreage of a high O/L variety being grown at this time is 'Flavor Runner 458' which is basically a high O/L Florunner that has limited disease resistance. Tx977053 has shown an average 21% yield advantage over Flavor Runner 458 in 21 tests between 1999 and 2001 (Table 1). This included a 5.7% average yield advantage in nine field tests that were disease free (non-significant, DMRT $p = 0.05$) and a 38% advantage in seven (7) field tests with TSWV, Sclerotinia blight, and/or other diseases (significant DMRT, $p = 0.05$) (see data and analyses in Appendix IV). Grades (TSMK) for Tx977053 have averaged 3% lower in non-diseased fields and nearly equal in areas of disease pressure (Table 1).

Several other comparisons are shown in Table 1 for West Texas, Oklahoma, Central, and South Texas. The yield and grade factors are about the same in all these tests. Tx977053 was in the top yielding class in most all tests, and often averaged higher than most varieties, lower in others, but only in the three-test averages at Ft. Cobb, OK was Tx977053 not in the top statistical group in yield per acre.

Disease evaluation:

Our disease evaluations of Tx977053 have been made at four locations. The TSWV evaluations have been conducted mostly in South Texas, near Pearsall, but some limited data has been collected at Stephenville, Texas. Sclerotinia evaluations were made at Stephenville and at Ft. Cobb, Oklahoma. Limited southern blight evaluations were made at Yoakum, Texas. Unfortunately, drought and confounding by other diseases at Stephenville have hampered some tests. The data are shown in **Appendix IV**.

Some statements regarding these and related data (some not shown) are appropriate, as follows:

- TSWV ratings of Tx977053 have been consistently better than the susceptible 'Tamrun 88'.
- TSWV ratings for Tx977053 have been better numerically than for Florunner in three of five tests.
- Two of three ratings for rust were better for Tx977053 than Florunner.
- Averages for Tx977053 for Sclerotinia ratings were consistently lower (lower is better) than Florunner, Okrun, and Flavor Runner 458, however most of the differences were not statistically significant, so it is difficult to make definitive decisions based solely on these data. (See **Appendix IV**).

Our observations of Tx977053 indicate that the line will perform better than Florunner and Flavor Runner 458 in fields infested with TSWV, sclerotinia, southern blight and rust (Appendix IV). However, the yield differences between Tx977053 and Flavor Runner 458 under diseased conditions were significant (Appendix IV), with TX977053 having a 38% advantage.

Table A. Data for main stem height, lateral branch length and leaflet length and width from three locations.

Line	MS hth cm	Lat. Lgt. cm	Leaflet lgt. mm	Leaflet wdt. mm
TX977053	43.6 a **	61.6 a	59.7 a	22.0 a
Florunner	37.6 b	55.4 a	45.9 c	18.9 b
Tamrun 96	31.5 c	44.9 b	48.2 c	20.0 b
Tamrun OL01	29.4 c	45.6 b	50.7 b	18.4 b

Table B. Pod and seed measurements.

Tx977056, Tamrun OL01, Florunner, & Tamrun 96

Pod and seed measurements in mm. Summary*

Pod	Tx977053	Tamrun OL01	Florunner	Tamrun 96	CV
Pod length	31.4 b**	33.6 a	28.6 d	29.4 c	9.98
Pod A width	11.6 b	12.8 a	11.4 b	11.7 b	8.39
Pod B width	12.1 b	13.6 a	11.8 b	11.5 b	8.04
Pod AB width	11.8 b	13.2 a	11.6 b	11.6 b	7.96
Constriction	8.8 b	10.5 a	9.1 b	9.1 b	13.2
Seed					
Seed Apical Lng.	16.3 a	17.6 a	14.3 b	14.0 b	10.8
Seed Basal Lng.	15.2 b	17.0 a	12.5 c	13.0 c	9.6
Seed A&B Lngt.	15.9 b	17.3 a	13.6 c	13.5 c	10.4
Seed Apical Wd.	8.85 a	8.4 a	7.6 b	8.7 a	11.9
Seed Basal Wd.	9.31 b	9.39 a	7.9 c	8.5 c	11.2
Seed A&B Wdt.	9.08 a	8.94 a	7.8 b	8.6 a	11

*This is a summary of 11 separate analyses conducted on data collected from three locations.

**Means followed by same letter in same row are not different DMRT (0.05)

Table C. Comparative data of conventional and high O/L
Peanut breeding lines grown in South and West Texas
(Unpublished data)

Oleic/Linoleic Acid Ratios 1993 - 1995 Crop Years

Breeding Line	Frio Co. Average 1994-95	Brazos Co. Average 1993-95	Gaines Co. Average 1994-95
Tx932802*	1.37	1.35	1.18
Tx932808*	18.67	20.26	15.56
Tx932821*	17.63	14.27	10.56
Tx932857*	1.28	1.25	0.99
Tx932894*	22.49	16.81	12.55
Tx932904*	1.33	1.27	1.05
Average	8.65	7.78	5.89
	Frio Co. % Frio Co.	Brazos Co. % Frio Co.	Gaines Co. % Frio Co.
Tx932802*	100.00	98.96	86.05
Tx932808*	100.00	108.52	83.35
Tx932821*	100.00	80.93	59.88
Tx932857*	100.00	98.31	77.62
Tx932894*	100.00	74.74	55.81
Tx932904*	100.00	95.39	79.29
	100.00	89.95	68.12

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Patty Acid Composition Results 01/08/2002

		Oil Value	FAC160	FAC180	FAC181	FAC182	FAC183	FAC200	FAC201	FAC220	FAC221	FAC240		
1	Steph	Unknown	10.8	5.31	2.23	1.70	75.58	7.02	0.00	1.32	2.52	3.00	0.34	2.15
2	Steph	Florunner	1.3	9.32	1.70	2.40	46.65	33.34	0.00	1.32	1.80	3.39	0.19	2.12
3	Steph	Tamrun 96	1.4	9.20	2.40	2.32	45.14	34.53	0.00	1.72	1.46	3.29	0.00	1.95
4	Steph	Tamrun 96	1.3	9.13	2.32	2.30	45.12	34.34	0.00	1.55	1.68	3.54	0.00	2.1
Duplicate		Tamrun 96	1.3	8.96	2.30	1.70	76.04	7.82	0.00	1.63	1.70	3.73	0.00	2.23
5	Steph	Flv.Ru.458	9.7	5.41	1.70	1.55	74.16	8.99	0.00	1.17	2.47	3.00	0.28	2.11
6	Steph	Flv.Ru.458	8.2	5.48	2.04	2.04	79.46	4.36	0.00	1.41	2.73	3.09	0.37	2.22
7	Steph	TR OL01	18.2	5.04	1.77	2.00	79.69	4.43	0.00	1.45	2.68	2.97	0.25	2.04
8	Steph	TR OL01	9.9	5.26	1.85	2.04	75.44	7.61	0.00	1.29	2.85	3.14	0.45	2.19
9	Steph	Tx977053	18.0	5.37	2.02	2.02	78.37	4.44	0.00	1.47	2.17	2.83	0.24	1.81
10	Steph	Tx977053	17.7	5.23	2.04	1.97	48.32	31.47	0.00	1.36	2.63	3.46	0.32	2.35
11	Frio Co	Florunner	1.6	9.37	2.02	2.02	48.78	31.12	0.28	1.42	1.50	3.19	0.15	2.01
12	Frio Co	Florunner	1.5	9.40	2.53	2.01	48.32	31.47	0.00	1.51	1.60	3.43	0.17	2.11
Duplicate		Florunner	1.6	9.42	2.02	2.08	48.36	31.06	0.00	1.39	1.67	3.54	0.17	2.15
13	Frio Co	Tamrun 96	1.7	9.35	2.45	2.01	50.28	29.43	0.00	1.75	1.38	3.31	0.00	1.97
14	Frio Co	Tamrun 96	1.6	9.31	2.16	2.08	48.93	31.05	0.00	1.57	1.47	3.25	0.00	1.97
15	Frio Co	TR OL01	17.9	5.81	2.05	2.05	79.08	4.41	0.00	1.44	2.04	2.90	0.21	1.95
16	Frio Co	TR OL01	15.5	5.55	2.01	2.01	77.16	4.99	0.00	1.42	2.34	3.09	0.27	2.98
17	Frio Co	Tx977053	19.8	5.66	2.08	2.08	79.32	4.01	0.31	1.41	2.09	2.99	0.20	1.95
18	Frio Co	Tx977053	16.4	5.74	1.92	1.92	78.18	4.78	0.00	1.41	2.25	3.26	0.24	2.10
19	West TX	Florunner	1.4	8.98	2.05	2.05	47.55	32.92	0.00	1.54	1.63	3.26	0.00	2.07
20	West TX	Florunner	1.4	9.23	2.03	2.03	46.01	34.02	0.00	1.39	1.68	3.36	0.17	2.11
Duplicate		Florunner	1.3	9.29	2.02	2.02	45.67	34.07	0.20	1.31	1.66	3.31	0.17	2.14
21	West TX	Tamrun 96	1.4	9.08	2.63	2.63	45.95	33.33	0.00	1.70	1.54	3.45	0.16	2.16
22	West TX	Tamrun 96	1.3	9.36	2.55	2.55	44.96	33.64	0.10	1.51	1.66	3.60	0.18	2.24
23	West TX	TR OL01	15.0	5.15	2.45	2.45	77.57	5.18	0.27	1.47	2.19	2.93	0.24	2.12
24	West TX	TR OL01	13.6	5.22	2.32	2.32	77.88	5.73	0.00	1.45	2.38	2.74	0.26	2.02
25	West TX	Tx977053	19.5	5.28	2.40	2.40	80.08	4.10	0.00	1.30	2.07	2.70	0.21	1.85
26	West TX	Tx977053	19.9	5.16	2.30	2.30	79.79	4.01	0.19	1.35	2.21	2.88	0.24	1.90

**Table D. Percentage of Oleic and
Linoleic acid in Tx977053
Samples from 2001 crop year**

Average for 100 randomly chosen seeds

O/L ratio = 29.3

%Oleic acid = 86.24

% Linoleic acid = 3.1

**Average for 100 seeds but eliminate any under
ratio of 18:1.**

O/L ratio = 29.6

% Oleic acid = 86.35

% Linoleic acid = 3.0

**Additional data for Tx977053 are presented in
Appendix III.**

Table E.

Sugar Content Tx977053

2001

Measurements in percent

	West TX ALT	South TX ALT	WTPGRF ALT	Mean
Tx977053	4.8	3.9	5.2	4.63 c*
Florunner	4.5	3.8	5	4.43 d
Tamrun OL01	5.4	4.4	5.9	5.23 a
Tamrun 96	4.9	4.1	5.3	4.77 bc
Flv. Run. 458	4.9	4.2	5.6	4.90 b

*Means followed by same letter are not different, DMRT (0.05)

Table 1. Comparison data on high O/L Tamrun OL01 and Tx977053
1998 to 2001

Yield, TSMK, 100 sd. wt., and Value/Acre

Variety/ Breeding line	Pods/Acre lbs.	TSMK %	100 Seed g	Val./Acre* \$	Disease %
5 Tests - West Texas 2000 - 2001					
Florunner	4300 a**	76.1 a	64.4 b	1413	
Tx977053	4123 a	71.2 b	67.8 b	1272	
Tamrun OL01	3767 a	73.2 b	76.8 a	1193	
4 Tests - West Texas 2000 - 2001					
Florunner	4447 a	78 a	66.1 bc	1466	
Flavor Runner 458	4411 a	76 a	63.3 c	1466	
TX977053	4289 a	72 b	69.9 b	1330	
Tamrun OL01	3873 a	74 ab	76.4 a	1236	
3 Tests - Ft. Cobb, Oklahoma 2000 - 2001					
Tamrun OL01	3830 a	69.6 a	70.7 a	1140	19.3**
Tx977053	3384 b	70.2 a	63.2 ab	1026	25.8**
Florunner	2882 c	70.1 a	55.6 bc	873	31.7**
Flavor Runner458	2779 c	71 a	53.7 c	776	39.4**
14 Tests - All areas -- All including Tx977053 and Flavor Runner 458					
Tamrun OL01	4502 a	70.2 bc	71.9 a	1,370	
Tx977053	4523 a	68.8 c	64.9 b	1,349	
Tamrun 96	4438 a	68.9 c	60.5 c	1,318	
Florunner	4176 ab	71.6 ab	58.8 cd	1,299	
Flv. Runner 458	3921 b	72.3 ab	57.7 d	1,232	

* Value determined by using Price Schedules for each year.

** Means followed by the same letter within the column and within one test site are not significantly different. Duncan MRT 0.05.

** Average percent sclerotinia diseased plants per plot

200300170

7053 RELEASE

10:45 Monday, July 1, 2002 9

General Linear Models Procedure

Dependent Variable: *Yield 100 sd wt*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	3274.37777778	148.83535354	19.91	0.0001
Error	40	299.06634921	7.47665873		
Corrected Total	62	3573.44412698			
	R-Square	C.V.	Root MSE	YIELD Mean	
	0.916309	4.141955	2.73434795	66.01587302	

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	2013.75365079	1006.87682540	134.67	0.0001
LOC	20	1260.62412698	63.03120635	8.43	0.0001
Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	2013.75365079	1006.87682540	134.67	0.0001
LOC	20	1260.62412698	63.03120635	8.43	0.0001

7053 RELEASE

10:45 Monday, July 1, 2002 10

General Linear Models Procedure

Duncan's Multiple Range Test for variable: *Yield 100 sd wt*

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 40 MSE= 7.476659

Number of Means 2 3
Critical Range 1.705 1.793

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T	
A	73.4952	21	TROL01	<i>Tammar OL01</i>
B	64.7238	21	TROL02	<i>Tammar OL02</i>
C	59.8286	21	FLO	<i>Flourmmer</i>

200300170

7053 RELEASE

10:45 Monday, July 1, 2002 6

100ndwt
~~Y2000~~

OBS	T	LOC	
1	FLO	1	62.5
2	FLO	2	65.5
3	FLO	3	64.2
4	FLO	4	57.2
5	FLO	5	53.9
6	FLO	6	59.7
7	FLO	7	69.0
8	FLO	8	72.6
9	FLO	9	58.6
10	FLO	10	51.0
11	FLO	11	59.2
12	FLO	12	56.7
13	FLO	13	62.3
14	FLO	14	82.1
15	FLO	15	59.9
16	FLO	16	54.6
17	FLO	17	53.9
18	FLO	18	58.8
19	FLO	19	56.5
20	FLO	20	57.3
21	FLO	21	60.9
22	TROLO1	1	77.1
23	TROLO1	2	76.4
24	TROLO1	3	75.3
25	TROLO1	4	73.8
26	TROLO1	5	63.7
27	TROLO1	6	77.9
28	TROLO1	7	79.6
29	TROLO1	8	77.6
30	TROLO1	9	77.4
31	TROLO1	10	61.4
32	TROLO1	11	79.8
33	TROLO1	12	66.6
34	TROLO1	13	76.7
35	TROLO1	14	78.2
36	TROLO1	15	72.6
37	TROLO1	16	72.4
38	TROLO1	17	66.5
39	TROLO1	18	71.0
40	TROLO1	19	71.0
41	TROLO1	20	68.4
42	TROLO1	21	80.0
43	TROLO2	1	61.9
44	TROLO2	2	64.5
45	TROLO2	3	65.9
46	TROLO2	4	63.1
47	TROLO2	5	56.9
48	TROLO2	6	66.0
49	TROLO2	7	72.0
50	TROLO2	8	74.5
51	TROLO2	9	69.3

7053 RELEASE

10:45 Monday, July

100ndwt
~~Y2000~~

OBS	T	LOC	
52	TROLO2	10	58.5
53	TROLO2	11	70.2
54	TROLO2	12	63.0
55	TROLO2	13	65.3
56	TROLO2	14	59.5
57	TROLO2	15	67.9
58	TROLO2	16	63.1
59	TROLO2	17	59.1
60	TROLO2	18	64.5
61	TROLO2	19	61.0
62	TROLO2	20	63.9
63	TROLO2	21	69.1

200300170

100 Seed weight for Tamrun OL 02
PVP application No. 200300170

<u>Location No.</u>	<u>Loc. ID</u>	<u>Test year</u>
1.	Frio Co. Neal Farm	1998
2.	Frio Co. Phillips Farm	1998
3.	Frio Co. Neal Farm	1999
4.	Frio Co. Phillips Farm	1999
5.	Frio Co. Neal Farm	2000
6.	Frio Co. Phillips Farm	2000
7.	Gaines Co. Johnson Frm.	2000
8.	Gaines Co. WTPGRF	2000
9.	Erath Co W/O Disease	2000
10.	Ft. Cobb Okla. Ham	2000
11.	Ft. Cobb Okla. Keim	2000
12.	Erath Co. 2001 UPPT	2001
13.	South Texas UPPT	2001
14.	West Texas UPPT	2001
15.	Frio Co. Phillips Farm	2001
16.	Frio Co. Neal Farm	2001
17.	Erath Co. W Disease	2001
18.	Erath Co. W/O Disease	2001
19.	Ft. Cobb Ham	2001
20.	Gaines Co. WTPGRF	2001
21.	Gaines Co. Johnson Farm	2001

Test 1

Erath County 2000 ALT 100 SD WT 09:27 Friday, September 24, 2004 2

Obs	T	Rep Loc	Loc SDWT
1	TROL02	1	69.5
2	TROL02	2	71.6
3	TROL02	3	76.7
4	TR96	1	68.6
5	TR96	2	69.7
6	TR96	3	68.7
7	FLO	1	62.7
8	FLO	2	52.3
9	FLO	3	60.7

The GLM Procedure

Dependent Variable: SDWT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	344.9911111	86.2477778	5.49	0.0639
Error	4	62.8244444	15.7061111		
Corrected Total	8	407.8155556			

R-Square	Coeff Var	Root MSE	SDWT Mean
0.845949	5.939691	3.963094	66.72222

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	318.7488889	159.3744444	10.15	0.0271
Loc Rep	2	26.2422222	13.1211111	0.84	0.4975

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	318.7488889	159.3744444	10.15	0.0271
Loc Rep	2	26.2422222	13.1211111	0.84	0.4975

Test 1

Eath Canty

2000 ALT 100 SD WT 09:27 Friday, September 24, 2004 5

The GLM Procedure

Duncan's Multiple Range Test for SDWT

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 4
 Error Mean Square 15.70611

Number of Means 2 3
 Critical Range 8.984 9.181

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T	
A	72.600	3	TROLO2	Tamron 0L02
A				
A	69.000	3	TR96	Tamron 96
B	58.567	3	FLO	Florumer

100 Seed wt

200300170

Test 2

Erath County

2001 ALT 100 SD WT 09:27 Friday, September 24, 2004 10

Obs	T	Rep Log	100 SDWT
1	TROLO2	1	64.4
2	TROLO2	2	60.3
3	TROLO2	3	63.3
4	TROLO2	4	65.7
5	TR96	1	58.1
6	TR96	2	54.1
7	TR96	3	62.4
8	TR96	4	60.7
9	FLO	1	58.5
10	FLO	2	57.9
11	FLO	3	56.2
12	FLO	4	62.6

The GLM Procedure

Dependent Variable: SDWT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	103.5650000	20.7130000	4.10	0.0577
Error	6	30.3250000	5.0541667		
Corrected Total	11	133.8900000			

R-Square	Coeff Var	Root MSE	SDWT Mean
0.773508	3.725182	2.248147	60.35000

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	56.73500000	28.36750000	5.61	0.0423
100 Rep	3	46.83000000	15.61000000	3.09	0.1114

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	56.73500000	28.36750000	5.61	0.0423
100 Rep	3	46.83000000	15.61000000	3.09	0.1114

200300170

Test 2 Erath County

2001 ALT 100 SD WT 09:27 Friday, September 24, 2004 13

The GLM Procedure

Duncan's Multiple Range Test for SDWT

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	6
Error Mean Square	5.054167

Number of Means	2	3
Critical Range	3.890	4.031

Means with the same letter are not significantly different.

Duncan Grouping

100 Seedwt
Mean

N

T

A	63.425	4	TR0LO2
B	58.825	4	TR96
B			
B	58.800	4	FLO

Tanner OLO2

Tanner 96

Floresmer

200300170

Test 3

Erath County 2000 UPPT 100 SD WT

14

09:27 Friday, September 24, 2004

Obs	T	Rep Loc	100 SDWT
1	TR0L02	1	60.8
2	TR0L02	2	61.8
3	TR0L02	3	62.4
4	TR0L02	4	58.3
5	TR96	1	51.1
6	TR96	2	54.9
7	TR96	3	48.8
8	TR96	4	52.2
9	FLO	1	57.4
10	FLO	2	54.0
11	FLO	3	52.7
12	FLO	4	53.8

The GLM Procedure

Dependent Variable: SDWT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	5	185.4283333	37.0856667	7.55	0.0144
Error	6	29.4883333	4.9147222		
Corrected Total	11	214.9166667			

R-Square	Coeff Var	Root MSE	SDWT Mean
0.862792	3.981294	2.216917	55.68333

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	173.4716667	86.7358333	17.65	0.0031
100 Rep	3	11.9566667	3.9855556	0.81	0.5326

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	173.4716667	86.7358333	17.65	0.0031
100 Rep	3	11.9566667	3.9855556	0.81	0.5326

200300170

Test 3

Grath County

200# UPPT 100 SD WT

2

17

09:27 Friday, September 24, 2004

The GLM Procedure

Duncan's Multiple Range Test for SDWT

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	6
Error Mean Square	4.914722

Number of Means	2	3
Critical Range	3.836	3.975

Means with the same letter are not significantly different.

Duncan Grouping	100 Seedwt Mean	N	T	
A	60.825	4	TR0L02	Tamum OL02
B	54.475	4	FLO	Floverunner
B	51.750	4	TR96	Tamum 96

Tammun OL02

Appendix I

Plant data

The GLM Procedure

Duncan's Multiple Range Test for ~~YIELD~~ *Mainstem Height*

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
Error Degrees of Freedom 33
Error Mean Square 16.24545
Harmonic Mean of Cell Sizes 9.869159

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	3.692	3.880	4.003

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	43.636	33	7053 = TX977053
B	37.625	8	FLO
C	31.500	8	TR96
C	29.375	8	7006 = Tannum 0601

↳ mean of 8 X 10 = 80 plants

The GLM Procedure

Dependent Variable: ~~YIELD~~ *Mainstem*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	2454.461404	106.715713	6.57	<.0001
Error	33	536.100000	16.245455		
Corrected Total	56	2990.561404			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.820736	10.31159	4.030565	39.08772

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	1915.175040	638.391680	39.30	<.0001
LOC	20	539.286364	26.964318	1.66	0.0960

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	1035.600000	345.200000	21.25	<.0001
LOC	20	539.286364	26.964318	1.66	0.0960

15:01 Wednesday, November 14, 2001

The GLM Procedure

Duncan's Multiple Range Test for *Lateral Branch Length*

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 33
 Error Mean Square 103.2534
 Harmonic Mean of Cell Sizes 9.869159

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	9.31	9.78	10.09

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	61.606	33	7053 = TX 972053
A			
A	55.375	8	FLO
B	45.625	8	7006 = Tammun 0401
B			
B	44.875	8	TR96 → mean of 8x10 = 80 plants

15:01 Wednesday, November 14, 2001

The GLM Procedure

Dependent Variable: *Lateral Branch Length*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	23	4345.514693	188.935421	1.83	0.0550
Error	33	3407.362500	103.253409		
Corrected Total	56	7752.877193			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.569503	18.09994	10.16137	56.14035

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	2890.373405	963.457802	9.33	0.0001
LOC	20	1455.141288	72.757064	0.70	0.7933

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	2413.837500	804.612500	7.79	0.0005
LOC	20	1455.141288	72.757064	0.70	0.7933

The GLM Procedure

Duncan's Multiple Range Test for ~~var~~ leaflet length

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha	0.05
Error Degrees of Freedom	163
Error Mean Square	31.36788
Harmonic Mean of Cell Sizes	45.40541

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	2.321	2.443	2.524

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	59.731	105	7053 = T7977053
B	50.700	40	7006 = Tammun 0601
C	48.225	40	TR96
C	45.914	35	FLO → mean of 35x10 = 350 leaflet

The GLM Procedure

Dependent Variable: ~~var~~ leaflet length

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	56	10234.53667	182.75958	5.83	<.0001
Error	163	5112.96379	31.36788		
Corrected Total	219	15347.50046			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.666854	10.41043	5.600703	53.79895

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	7497.819740	2499.273247	79.68	<.0001
LOC	53	2736.716929	51.636168	1.65	0.0094

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	6764.038609	2254.679536	71.88	<.0001
LOC	53	2736.716929	51.636168	1.65	0.0094

15:01 Wednesday, November 14, 2001

The GLM Procedure

200300170

Duncan's Multiple Range Test for ~~width~~ leaflet width

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 163
 Error Mean Square 12.61658
 Harmonic Mean of Cell Sizes 45.40541

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	1.472	1.549	1.601

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	22.0338	105	7053 = TX972053
B	20.0500	40	TR96
B			
C B	18.9143	35	FLO
C			
C	18.4250	40	7006 = Tammun 0601

mean of 40x10 = 400 leaflets

15:01 Wednesday, November 14, 2001

The GLM Procedure

Dependent Variable: ~~width~~ leaflet width

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	56	1129.766679	20.174405	1.60	0.0122
Error	163	2056.502319	12.616579		
Corrected Total	219	3186.268998			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.354574	17.30928	3.551982	20.52068

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	515.2580644	171.7526881	13.61	<.0001
LOC	53	614.5086145	11.5945022	0.92	0.6316

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	470.2258612	156.7419537	12.42	<.0001
LOC	53	614.5086145	11.5945022	0.92	0.6316

Appendix II

Pod and Seed Data

The GLM Procedure

Duncan's Multiple Range Test for ~~YIELD~~ *Pod Length*

200300170

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 397
 Error Mean Square 9.518287
 Harmonic Mean of Cell Sizes 114.2857

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	.8024	.8447	.8730

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	33.6563	100	7006 = <i>Tamara 0201</i>
B	31.4200	200	7053 = <i>TX999053</i>
C	29.4257	100	TR96
D	28.5850	100	FLO

The GLM Procedure

Dependent Variable: ~~YIELD~~ *Pod Length*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	102	2614.113798	25.628567	2.69	<.0001
Error	397	3778.759822	9.518287		
Corrected Total	499	6392.873620			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.408911	9.983923	3.085172	30.90140

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	1567.076538	522.358846	54.88	<.0001
LOC	99	1047.037260	10.576134	1.11	0.2416

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	1567.076538	522.358846	54.88	<.0001
LOC	99	1047.037260	10.576134	1.11	0.2416

09:15 Friday, November 16, 2001

The GLM Procedure

Duncan's Multiple Range Test for ~~YIELD~~ *Pod diameter*

200300170

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 47
 Error Mean Square 0.971679
 Harmonic Mean of Cell Sizes 12.30769

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	.7994	.8407	.8678

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	12.7780	10	7006 = Tamran 0401
B	11.7400	10	TR96
B	11.5615	40	7053 = TR977053
B	11.4040	10	FLO
B			L 10K10 = 100 pods

7053 PODA WIDTH-COMB.GR1&2

23

09:15 Friday, November 16, 2001

The GLM Procedure

Dependent Variable: ~~YIELD~~ *Pod diameter*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	39.94710229	1.81577738	1.87	0.0363
Error	47	45.66889200	0.97167855		
Corrected Total	69	85.61599429			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.466585	8.397628	0.985738	11.73829

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	13.17768429	4.39256143	4.52	0.0073
LOC	19	26.76941800	1.40891674	1.45	0.1500

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	10.29316800	3.43105600	3.53	0.0218
LOC	19	26.76941800	1.40891674	1.45	0.1500

09:15 Friday, November 16, 2001

The GLM Procedure

Duncan's Multiple Range Test for ~~YIELD~~ *Pod construction*

2003 00 17 0

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
Error Degrees of Freedom 47
Error Mean Square 1.455567
Harmonic Mean of Cell Sizes 12.30769

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	0.978	1.029	1.062

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	10.5490	10	7006 = Tammun 0401
B	9.1270	10	FLO
B	9.1120	10	TR96
B	8.8095	40	7053 = TX977053
			L 40 X 10 = 400 pods

09:15 Friday, November 16, 2001

The GLM Procedure

Dependent Variable: ~~YIELD~~ *Pod construction*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	70.0049051	3.1820411	2.19	0.0123
Error	47	68.4116720	1.4555675		
Corrected Total	69	138.4165771			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.505755	13.19040	1.206469	9.146571

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	24.22852714	8.07617571	5.55	0.0024
LOC	19	45.77637800	2.40928305	1.66	0.0813

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	18.50878800	6.16959600	4.24	0.0099
LOC	19	45.77637800	2.40928305	1.66	0.0813

The GLM Procedure

Duncan's Multiple Range Test for ~~YIELD~~ *Seed length*

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 117
 Error Mean Square 2.594795
 Harmonic Mean of Cell Sizes 24.61538

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	.9093	.9570	.9887

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	17.3490	20	7006 = Tammun OL01
B	15.9820	80	7053 = TX477053
C	13.5625	20	FLO
C	13.5375	20	TR96

20 x 10 = 200 seeds

7053 SEEDA&B LENGTH-COMB.GR1&2

50

09:15 Friday, November 16, 2001

The GLM Procedure

Dependent Variable: ~~YIELD~~ *Seed length*

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	384.0902003	17.4586455	6.73	<.0001
Error	117	303.5909740	2.5947946		
Corrected Total	139	687.6811743			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.558529	10.40429	1.610837	15.48243

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	239.0249643	79.6749881	30.71	<.0001
LOC	19	145.0652360	7.6350124	2.94	0.0002

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	281.0194160	93.6731387	36.10	<.0001
LOC	19	145.0652360	7.6350124	2.94	0.0002

The GLM Procedure

Duncan's Multiple Range Test for ~~SEED~~

200300170

Seed width (diameter)

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 117
 Error Mean Square 0.945445
 Harmonic Mean of Cell Sizes 24.61538

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	.5489	.5777	.5968

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	9.0884	80	7053 = TX977053
A	8.9450	20	7006 = Tamrun 0601
A	8.5880	20	TR96
B	7.8170	20	FLO

20 X 10 = 200 seed

The GLM Procedure

Dependent Variable: ~~SEED~~ Seed width (diameter)

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	68.7834771	3.1265217	3.31	<.0001
Error	117	110.6170165	0.9454446		
Corrected Total	139	179.4004936			

R-Square	Coeff Var	Root MSE	YIELD Mean
0.383407	11.03078	0.972340	8.814786

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	3	27.26736482	9.08912161	9.61	<.0001
LOC	19	41.51611225	2.18505854	2.31	0.0034

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	3	30.76801350	10.25600450	10.85	<.0001
LOC	19	41.51611225	2.18505854	2.31	0.0034

Appendix III

Chemical,
Organoleptic, and
Shelling Data

**O/L Ratio of Tx977053 individual seed used for
Breeder seed increase**

Sample #	All samples included			Exclude samples less than O/L 18:1		
	O/L	% Oleic	% linoleic	O/L	% Oleic	% linoleic
162	22.4	83.9	3.7	22.4	83.9	3.7
163	22.2	86.1	3.9	22.2	86.1	3.9
164	17.2	83.4	4.8			
165	25.6	85.2	3.3	25.6	85.2	3.3
166	28.3	86.9	3.1	28.3	86.9	3.1
167	40.5	87.1	2.1	40.5	87.1	2.1
168	35.2	87.7	2.5	35.2	87.7	2.5
169	34	87.3	2.6	34	87.3	2.6
170	35.8	86.2	2.4	35.8	86.2	2.4
171	19.9	85.1	4.3	19.9	85.1	4.3
172	15.7	81.5	5.2			
173	22.2	85.1	3.8	22.2	85.1	3.8
174	28.5	87.3	3.1	28.5	87.3	3.1
175	31.1	85.7	2.8	31.1	85.7	2.8
176	32.6	86.3	2.6	32.6	86.3	2.6
177	22.5	85.5	6.8	22.5	85.5	6.8
178	34.6	87.1	2.5	34.6	87.1	2.5
179	27.2	85.4	3.1	27.2	85.4	3.1
180	39	88.1	2.3	39	88.1	2.3
181	43.2	86.3	2	43.2	86.3	2
182	30.8	86.6	2.8	30.8	86.6	2.8
183	28.9	87.3	3	28.9	87.3	3
184	22.8	84.9	3.7	22.8	84.9	3.7
185	23.4	84.9	3.6	23.4	84.9	3.6
186	31.3	86.6	2.8	31.3	86.6	2.8
187	35.3	87.1	2.5	35.3	87.1	2.5
188	27.1	85.7	3.2	27.1	85.7	3.2
189	24	87.2	3.6	24	87.2	3.6
190	37.1	86.5	2.3	37.1	86.5	2.3
191	35.5	87.5	2.5	35.5	87.5	2.5
192	34.3	87.2	2.5	34.3	87.2	2.5
193	27.9	86.3	3.1	27.9	86.3	3.1
194	30.1	86.3	2.9	30.1	86.3	2.9
195	26.4	86.5	3.3	26.4	86.5	3.3
196	26.7	88.1	3.3	26.7	88.1	3.3
197	27	86.1	3.2	27	86.1	3.2
198	24.9	86.2	3.5	24.9	86.2	3.5
199	21	84.9	4	21	84.9	4
200	24	86.9	3.6	24	86.9	3.6
201	24.8	86.7	3.5	24.8	86.7	3.5
202	33.1	87.5	2.6	33.1	87.5	2.6
203	45.2	87.7	1.9	45.2	87.7	1.9
204	24.5	86.2	3.5	24.5	86.2	3.5
205	35.4	87.3	2.5	35.4	87.3	2.5
206	24.2	85.8	3.5	24.2	85.8	3.5
207	26.6	84.9	3.2	26.6	84.9	3.2
208	25.3	86.1	3.4	25.3	86.1	3.4
209	33.6	86.9	2.6	33.6	86.9	2.6
210	29.2	85.6	2.9	29.2	85.6	2.9

Sample #	O/L	% Oleic	% linoleic	O/L	% Oleic	% linoleic
211	24.6	85.1	3.5	24.6	85.1	3.5
212	22.9	83.9	3.7	22.9	83.9	3.7
213	27.6	85.8	3.1	27.6	85.8	3.1
214	22.6	85.1	3.8	22.6	85.1	3.8
215	23.8	85.2	3.6	23.8	85.2	3.6
216	30.1	86.1	2.9	30.1	86.1	2.9
217	30.4	86.6	2.8	30.4	86.6	2.8
218	33.4	87.5	2.6	33.4	87.5	2.6
219	30.2	86.9	2.9	30.2	86.9	2.9
220	21.5	85.6	4	21.5	85.6	4
221	24.5	85.1	3.5	24.5	85.1	3.5
222	29.6	86.9	2.9	29.6	86.9	2.9
223	32	87.4	2.7	32	87.4	2.7
224	24.3	85.2	3.5	24.3	85.2	3.5
225	25.4	85.9	3.4	25.4	85.9	3.4
226	17.3	83.8	4.9			
227	31.4	86.1	2.7	31.4	86.1	2.7
228	30	86.8	2.9	30	86.8	2.9
229	39	86.9	2.2	39	86.9	2.2
230	37.1	87.4	2.4	37.1	87.4	2.4
231	29.2	87.6	3	29.2	87.6	3
232	39.3	86.9	2.2	39.3	86.9	2.2
233	23.4	86.6	3.7	23.4	86.6	3.7
234	25	85.6	3.4	25	85.6	3.4
235	39.7	87	2.2	39.7	87	2.2
236	35.3	87.1	2.5	35.3	87.1	2.5
237	42.4	85.5	2	42.4	85.5	2
238	35.3	87.8	2.5	35.3	87.8	2.5
239	18.3	82.3	4.5	18.3	82.3	4.5
240	33.7	86.9	2.6	33.7	86.9	2.6
241	31.8	88.1	2.8	31.8	88.1	2.8
242	25.3	86.3	3.4	25.3	86.3	3.4
243	28.1	87.1	3.1	28.1	87.1	3.1
244	28.5	86.7	3	28.5	86.7	3
245	27	86.5	3.2	27	86.5	3.2
246	35.1	87	2.5	35.1	87	2.5
247	27	85.9	3.2	27	85.9	3.2
248	20.3	85.5	4.2	20.3	85.5	4.2
249	25.1	86.5	3.4	25.1	86.5	3.4
250	31	86.4	2.8	31	86.4	2.8
251	30.9	86.5	2.8	30.9	86.5	2.8
252	29.6	86.7	2.9	29.6	86.7	2.9
253	33.4	86.7	2.6	33.4	86.7	2.6
254	26.4	86	3.2	26.4	86	3.2
255	44.4	88.4	1.9	44.4	88.4	1.9
256	28.5	86	3	28.5	86	3
257	26.5	86.1	3.2	26.5	86.1	3.2
258	31.5	86	2.7	31.5	86	2.7
259	38.2	85.9	2.2	38.2	85.9	2.2
260	32.5	86	2.6	32.5	86	2.6
261	30.3	86.6	2.8	30.3	86.6	2.8
Total	2928.8	8624.2	310	2878.6	8375.5	295.1
mean	29.3	86.24	3.1	29.6	86.35	3



J. LEEK ASSOCIATES, INC.
~BY WORKING TOGETHER, IT CAN BE DONE~

PEANUT SEED PERFORMANCE GENERAL GUIDELINES

OIL QUALITY PARAMETERS

Peroxide Value (PV) is defined as the number of milli-equivalents as peroxide in 1000 grams of sample. It is an indicator of the degree of rancidity of a fat, but is not an "absolute index of rancidity". Peroxides form in direct proportion to oxygen absorption, but peroxides also break down readily. Therefore, the amount present in the fat at the time of the test is frequently much lower than the total amount formed.

Guidelines:

Raw peanuts (fresh): typically 0.4 max

PV > 1.0 – need to find out what's going on

PV > 2.0 – not good

PV > 3.0 – almost impossible

Blanched peanuts: typically 1.0-3.0 (usually less than 2.0)

Roasted peanuts: can vary between 3 and 100, depending on how old (should be 3-5 on very fresh nuts).

Percent Free Fatty Acids (FFA) of a fat is a measure of the extent of hydrolysis (decomposition due to reaction with water) that has occurred in a fat. Grade factors decrease and free fatty acids increase in peanuts improperly warehoused and/or cured. Levels of deterioration are related to seed condition, length of storage, excess moisture, high temperature, and chemical damage. FFA is a good partner to PV for measuring fat quality deterioration.

Guidelines:

FFA < 0.03% is normal

Typically the upper limit for well-handled, fresh peanuts is 0.05%

Oleic/Linoleic Acid Ratio (O/L) is used as an indicator of oil stability and shelf life. It has been suggested that the selection of raw peanuts with low levels of linoleic acid is a means of extending product shelf life. Lower levels of polyunsaturated fatty acids provide less substrate for the enzyme lipoxygenase to catalyze oxygen. The principal substrates for lipoxygenase in plant systems are linoleic and linolenic acids. The primary products of the lipoxygenase-fatty acid reaction are lipid hydroperoxides, which may undergo further chemical oxidation or decomposition to produce a variety of secondary products such as aldehydes, alcohols, ketones, and acids. These are potential sources of off-flavors in many foods including peanuts and peanut products. Consequently, peanuts high in oleic acid and low in linoleic acid content are preferred to achieve better oil stability.

Guidelines for Non-High O/L Varieties

SE Runners: Typically 1.8-2.2

SW Runners: Typically 1.2-1.8

Virginias: Typically 1.6-2.5 heavily variety dependent

Spanish: Typically 1.1-1.5



200300170

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BLANCHABILITY AND ROAST VARIABILITY

Blanchability is very dependent on the use (i.e. salted nuts, candy, butter, etc...). Blanching is the removal of the testa or seed coat from shelled raw or roasted kernels. For raw peanuts this is usually done by "white roasting" or partially drying the peanuts and then processing the kernels through various types of blanchers which subject the kernels to thorough, but gentle, rubbing type friction action, followed by aspiration. Removal of the seed coat typically produces a weight loss of 3.0 to 3.5% for the shelled peanut kernels depending upon the peanut variety and grade being processed. There are four general blanching methods: 1) spin, 2) buff, 3) split, and 4) water. Each blanching process has unique utilization applications. Spin blanching will produce a premium cocktail peanut, while buff blanching is used more in preparing peanuts for confectionary coatings. Split blanching is used primarily for peanuts going into peanut butter or to prepare peanuts for removal of damaged kernels and foreign material by extensive electronic sorting. Water blanching is used to produce a "unique", crunchy texture required in many specialty products. Typical specifications for spin and buff blanched peanuts are as follows.

Physical Specifications		Chemical Specifications	
Whole Kernels	80-85%	Moisture	4.5-5.0%
Split Kernels	15-20%	Oil	49-51%
Rednose ¹	3.0%	Iodine Value	95
Unblanched ²	1.0%	Free Fatty Acids	0.30%
Damaged Kernels	1.0%	Peroxide Value	5.0 meq
		Aflatoxin	5.0 ppb

¹ Seed coat at 1/4 inch or less, largest diameter.
² Seed coat 1/4 inch or greater, largest diameter.

Roast Variability is dependent upon many things (i.e., sugar, fat, and moisture distributions) that can be difficult to quantify. Roast variability is an important quality characteristic for all manufacturers when blending peanuts for their product, however, for manufacturers that produce "whole nut snacks" this becomes even more important. Peanuts used in non-coated, "whole nut snacks" must be very pleasing to the consumer's eye. Ranges in roast variability can vary among manufacturers. Our experience has shown that roast variability can be divided into three categories: 1) good, 2) fair, and 3) poor with the percentage of over roasted kernels ranging from ≤10%, 11-20%, and >20%, respectively.

SENSORY ANALYSIS

Flavor can be one of the most important characteristics of a peanut. The foods/snacks that consumers purchase that contain peanuts, just like any other food purchase, are based on repeat business. This means that consumers will purchase something that they like as long as they get what they want. Consumers of peanut products want a product that has a robust peanut flavor, not too sweet, with no offensive flavors. Other

Flavor Intensities and Attributes

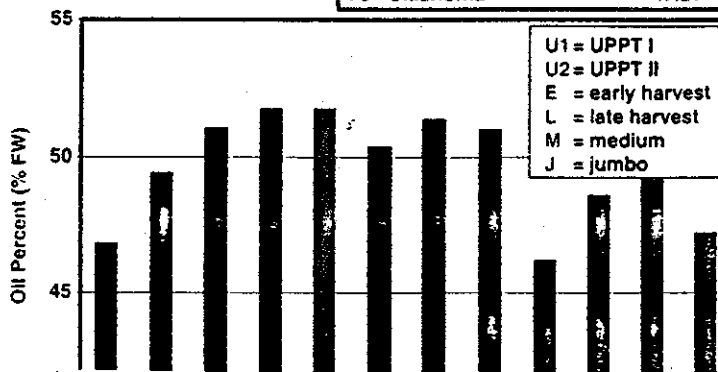
	RP	SA	ST	RBG	DR	WHS	CD8D	EARTHY	POO	FSOR	PC	BITTER	METALLIC	AST
1 Steph	5.4	2.2	2.4	1.2	2.8	3.2	0	0	0	0	0	1	0	0
2 Steph	5.6	2.2	2.4	0.8	3.6	3	0	0	0	0	0	1.2	0	1.6
3 Steph	5.4	2.4	2.8	1.6	1.4	2.8	0	0	0	0	0	0	0	0
4 Steph	5	2.6	3	1.8	1.4	2.8	0	0	0	0.6	0	1	0	0
5 Steph	5.4	2.6	2.8	1.4	2.6	3.2	0	0	0	0	0	0	0	1.2
6 Steph	5	2.6	3	1.2	2.8	3.2	0	0	0	2.4	0	0	0	0
7 Steph	5	2	3	1.6	1.4	3	0	0	0	1.2	0	0	0	0
8 Steph	5.2	2.8	3.4	1	3.2	3.2	0	0	0	1.8	0	0	0	0
9 Steph	5	2.6	3	2.6	2.6	2.2	0	0	0	0	0	0	0	0
10 Steph	4.8	2.2	2.8	1.4	1.4	3.2	0	0	0	0	0	0	0	0
11 Frio Co	5	2.4	3.2	2.2	1	2.8	0	0	0	0	0	0	0	0
12 Frio Co	5.6	2.6	3	1.4	2	3.2	0	0	0	0	0	0	0	0
13 Frio Co	5	2.8	3	1.8	1.6	3.2	0	0	0	0	0	0	0	1.2
14 Frio Co	5.4	2.4	3	1.4	2.6	2.8	0	0	0	0	0	1	0	1.2
15 Frio Co	5.2	2.6	3.2	1.4	2.2	3.2	0	0	0	0	0	0	0	0
16 Frio Co	5.2	2.8	3.2	1.2	2	3	0	0	0	0	0	0	0	0
17 Frio Co	5.4	2.6	2.2	0.8	3.4	3.4	0	0	0	0	0	0	0	0
18 Frio Co	5.4	3	3	1.6	3	2.4	0	0	0	0	0	1	0	0
19 West TX	5.4	2.6	3.4	1.6	2.2	2.2	0	0	0	0	0	1	0	0
20 West TX	5.2	3	3.2	1.2	2.4	2.6	0	0	0	0	0	0	0	0
21 West TX	5.2	2.8	2.8	1.8	2.2	3	0	0	0	0	0	0	0	1.4
22 West TX	5	3.2	4	1	1.6	2.8	0	0	0	0	0	0	0	0
23 West TX	5.8	2.8	3.2	1	3	3.2	0	0	0	0	0	0	0	0
24 West TX	5.2	2.4	3.2	0	2.6	2.6	0	0	0	0	0	0	0	0
25 West TX	5.4	2.2	3.2	0	2.2	3.2	0	0	0	0	0	0	0	0
26 West TX	5.4	2.6	3	1.2	2	3.2	0	0	0	0	0	0	0	0
[Control]	6	3	3	2	3	4	0	0	0	0	0	2	0	3

Oil Content

TX977053

Mean 49.5

Location	Oil Content (% FW)
10 - Virginia - UPPT I	46.87
10 - Virginia - UPPT II	49.42
20 - North Carolina - Late	51.02
20 - North Carolina - Early	51.71
30 - Georgia	51.73
40 - Alabama - medium	50.33
40 - Alabama - jumbo	51.36
50 - Florida	50.97
61 - Texas, Central	46.20
62 - Texas, South	48.58
63 - Texas, West	49.15
70 - Oklahoma	47.21

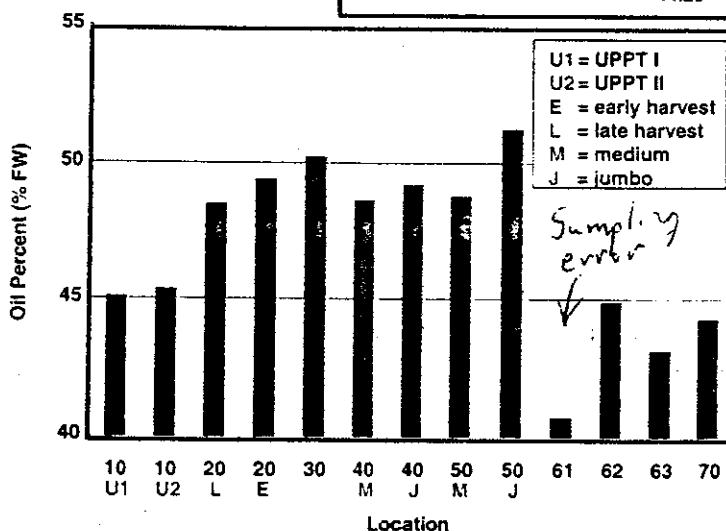


Oil Content

TX977006

Mean 47.3

Location	Oil Content (% FW)
10 - Virginia - UPPT I	45.12
10 - Virginia - UPPT II	45.37
20 - North Carolina - Late	48.48
20 - North Carolina - Early	49.37
30 - Georgia	50.21
40 - Alabama - medium	48.63
40 - Alabama - jumbo	49.14
50 - Florida - medium	48.77
50 - Florida - jumbo	51.19
61 - Texas, Central	40.67
62 - Texas, South	44.88
63 - Texas, West	43.16
70 - Oklahoma	44.26

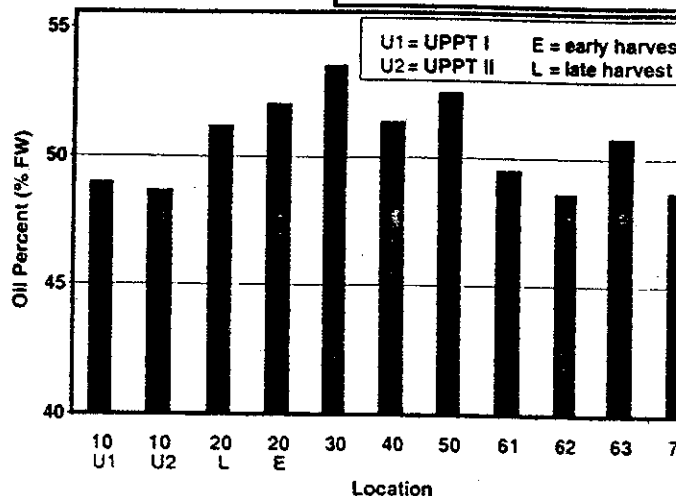


Oil Content

Florunner

Mean 50.5

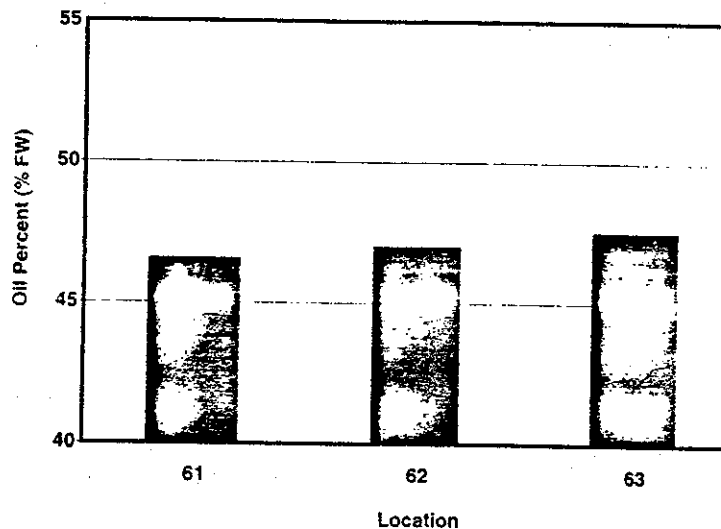
Location	Oil Content (% FW)
10 - Virginia - UPPT I	48.94
10 - Virginia - UPPT II	48.69
20 - North Carolina - Late	51.21
20 - North Carolina - Early	52.04
30 - Georgia	53.52
40 - Alabama	51.37
50 - Florida	52.48
61 - Texas, Central	49.51
62 - Texas, South	48.61
63 - Texas, West	50.79
70 - Oklahoma	48.66



Tamrun 96

Mean 47.0

61 - Texas, Central	46.59
62 - Texas, South	46.98
63 - Texas, West	47.54



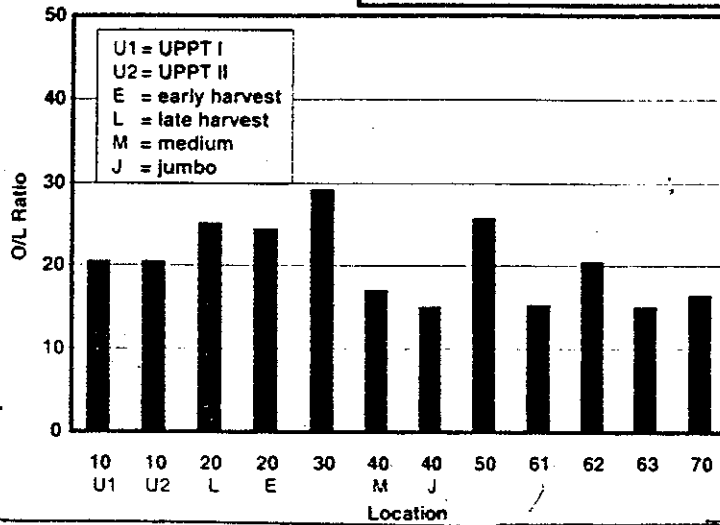
O/L Ratio

Location

O/L Ratio

TX977053

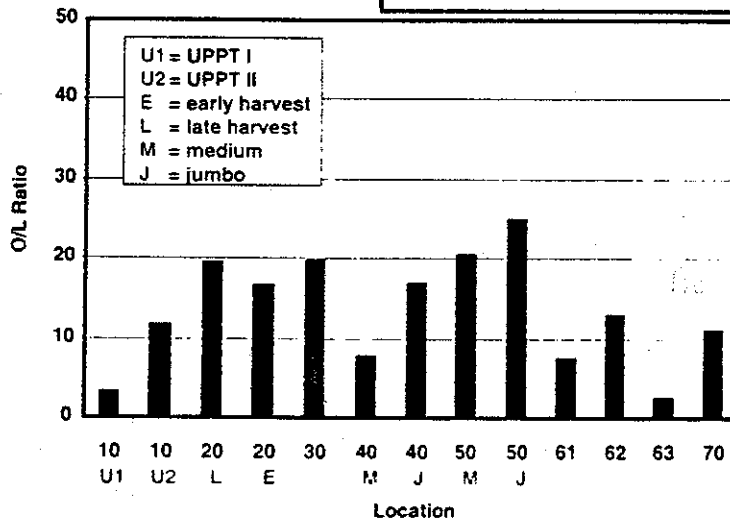
Mean 20.4



10 - Virginia - UPPT I	3.23
10 - Virginia - UPPT II	11.77
20 - North Carolina - Late	19.60
20 - North Carolina - Early	16.64
30 - Georgia	19.75
40 - Alabama - medium	7.78
40 - Alabama - jumbo	16.98
50 - Florida - medium	20.63
50 - Florida - jumbo	25.09
61 - Texas, Central	7.61
62 - Texas, South	13.02
63 - Texas, West	2.57
70 - Oklahoma	11.01

TX977006

Mean 13.9



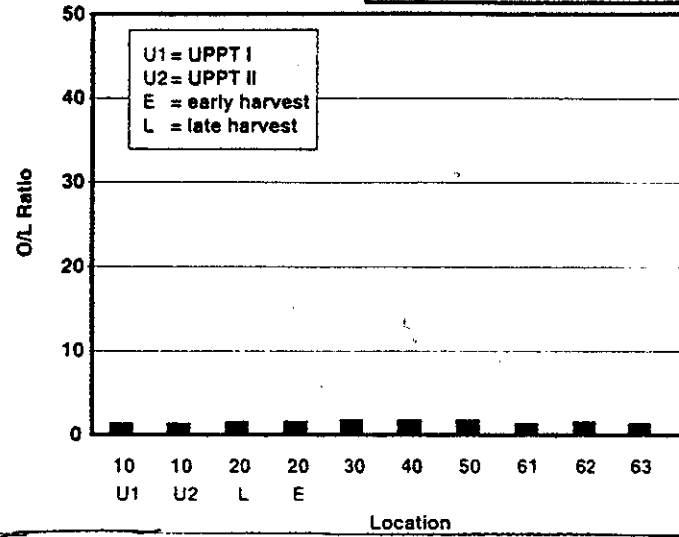
2003
O/L Ratio

00170
Location

O/L Ratio

Florunner

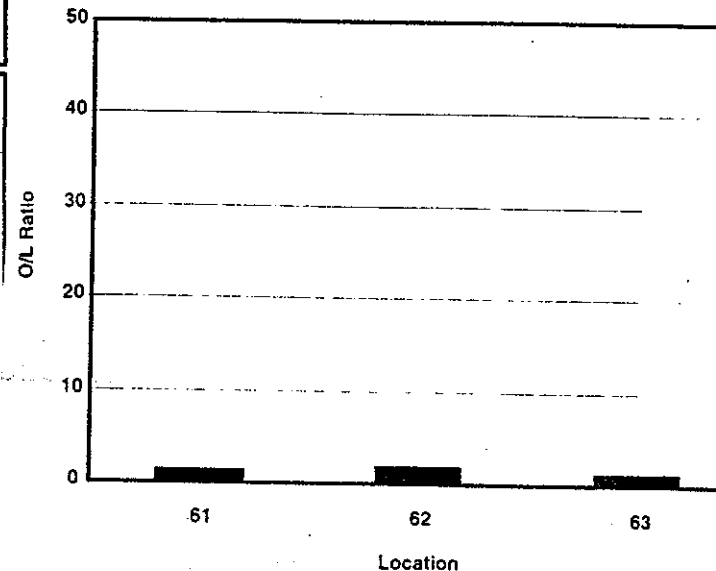
Mean 1.55



61 - Texas, Central	1.36
62 - Texas, South	1.86
63 - Texas, West	1.30

Tamrun 96

Mean 1.50



Iodine Value

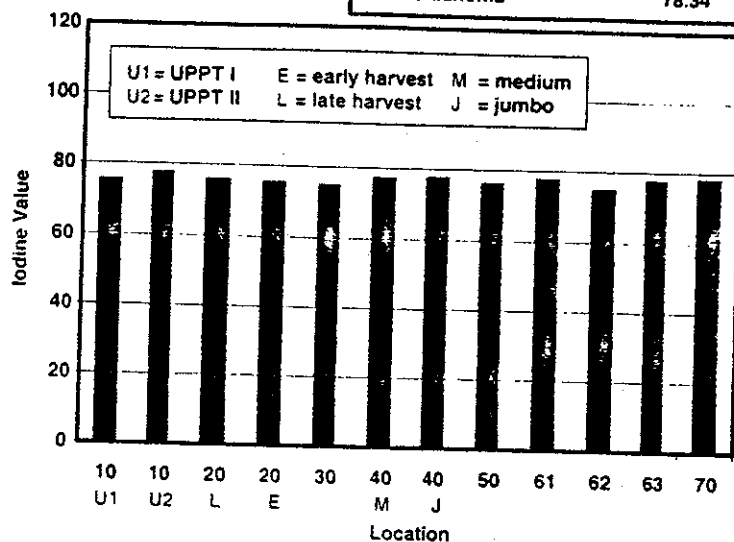
Location

Iodine Value

TX977053

Mean 76.8

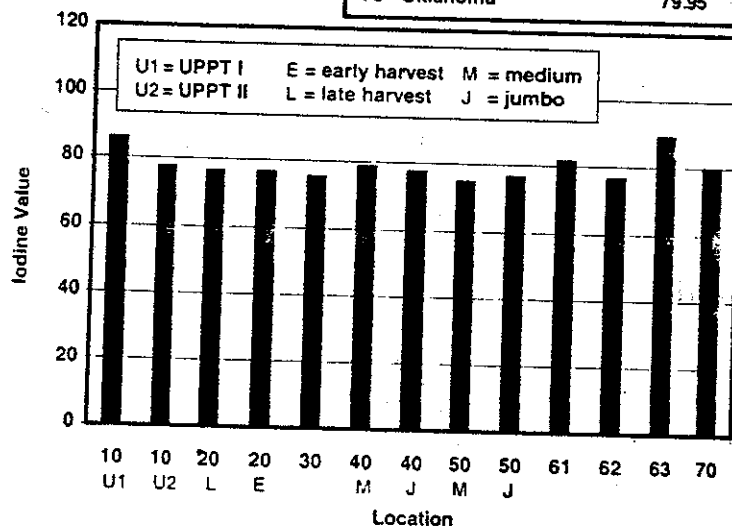
10 - Virginia - UPPT I	75.48
10 - Virginia - UPPT II	77.67
20 - North Carolina - Late	75.92
20 - North Carolina - Early	75.58
30 - Georgia	75.26
40 - Alabama - medium	77.38
40 - Alabama - jumbo	78.01
50 - Florida	76.66
61 - Texas, Central	78.06
62 - Texas, South	75.15
63 - Texas, West	77.73
70 - Oklahoma	78.34



TX977006

Mean 79.6

10 - Virginia - UPPT I	86.27
10 - Virginia - UPPT II	77.79
20 - North Carolina - Late	76.75
20 - North Carolina - Early	76.89
30 - Georgia	75.54
40 - Alabama - medium	79.24
40 - Alabama - jumbo	77.79
50 - Florida - medium	75.40
50 - Florida - jumbo	76.79
61 - Texas, Central	81.77
62 - Texas, South	76.98
63 - Texas, West	89.78
70 - Oklahoma	79.95



Iodine Value

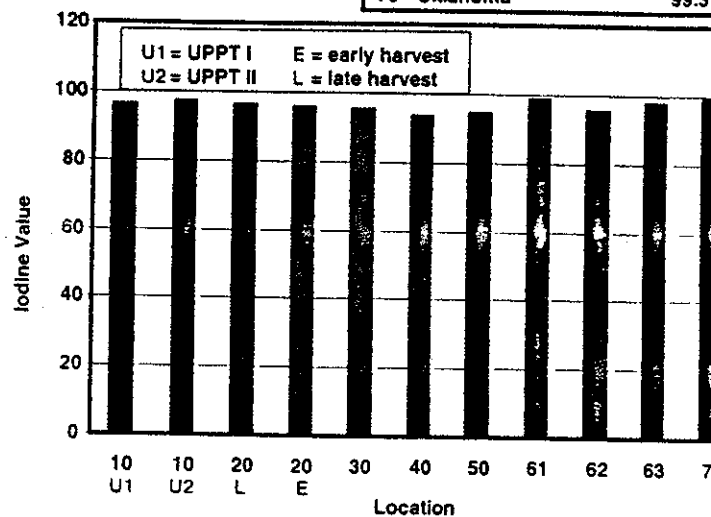
Location

Iodine Value

Florunner

Mean 96.6

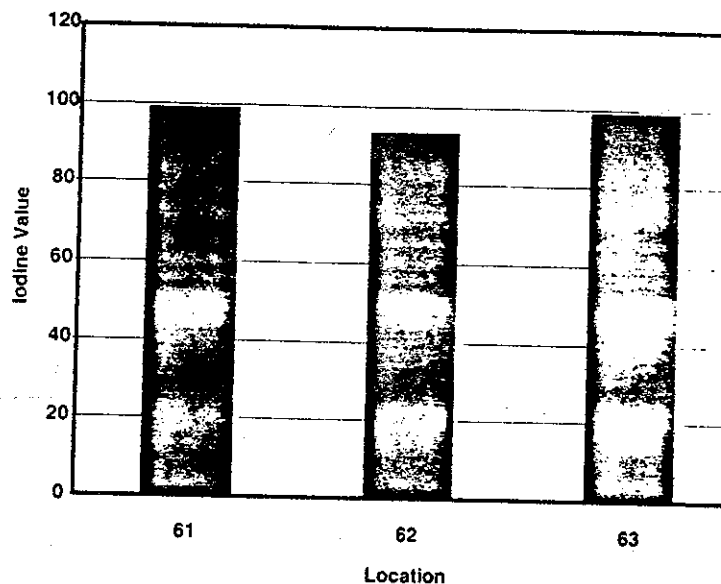
10 - Virginia - UPPT I	96.5
10 - Virginia - UPPT II	97.4
20 - North Carolina - Late	96.6
20 - North Carolina - Early	96.0
30 - Georgia	95.8
40 - Alabama	93.7
50 - Florida	94.5
61 - Texas, Central	99.1
62 - Texas, South	95.5
63 - Texas, West	98.1
70 - Oklahoma	99.3



61 - Texas, Central	99.13
62 - Texas, South	93.17
63 - Texas, West	98.74

Tamrun 96

Mean 97.2



Total Sugars

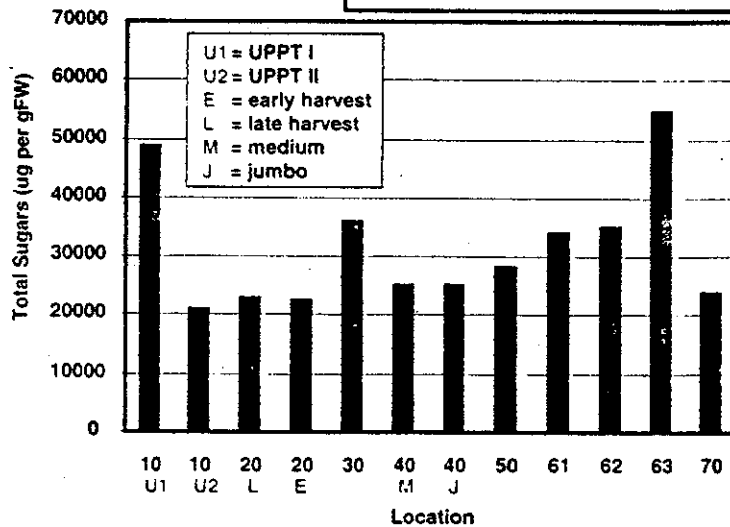
TX977053

Mean 3.16%

Location

Total Sugars
(ug/gFW)

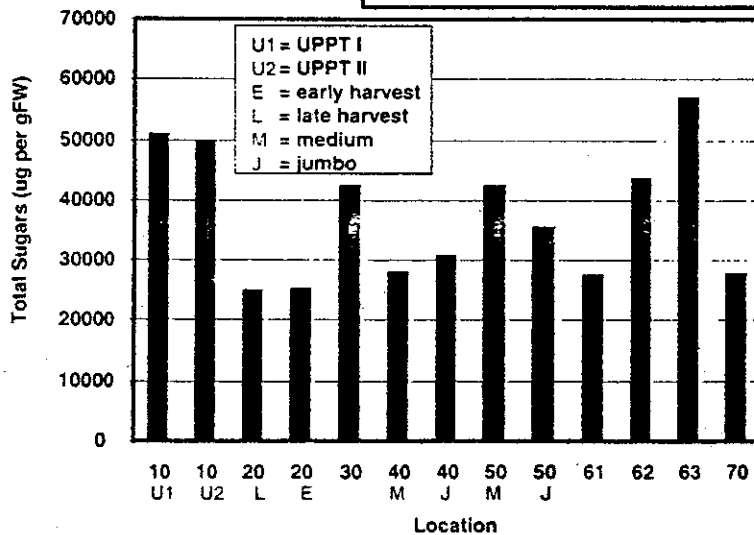
10 - Virginia - UPPT I	49016.0
10 - Virginia - UPPT II	21247.6
20 - North Carolina - Late	22936.7
20 - North Carolina - Early	22737.9
30 - Georgia	36069.9
40 - Alabama - medium	25200.1
40 - Alabama - jumbo	25201.6
50 - Florida	28569.0
61 - Texas, Central	34304.5
62 - Texas, South	35004.5
63 - Texas, West	55108.6
70 - Oklahoma	24052.0



10 - Virginia - UPPT I	50963.6
10 - Virginia - UPPT II	50007.3
20 - North Carolina - Late	25050.5
20 - North Carolina - Early	25277.9
30 - Georgia	42460.7
40 - Alabama - medium	28149.2
40 - Alabama - jumbo	30733.0
50 - Florida - medium	42491.6
50 - Florida - jumbo	35566.3
61 - Texas, Central	27678.7
62 - Texas, South	43564.4
63 - Texas, West	57182.2
70 - Oklahoma	27967.6

TX977006

Mean 3.70%



200300170

Total Sugars

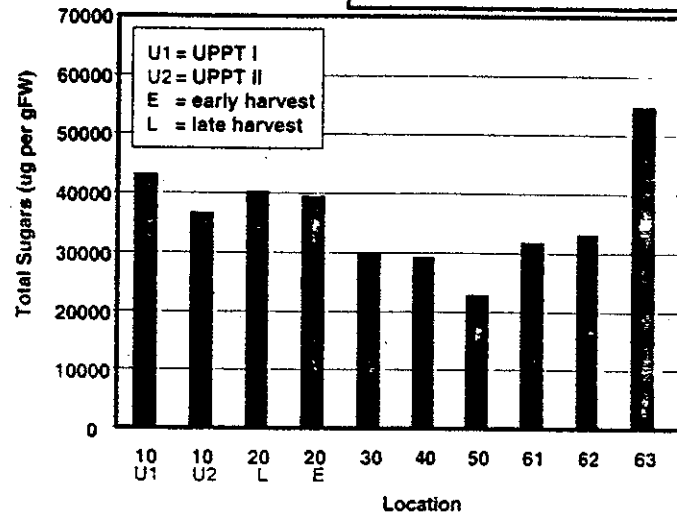
Florunner

Mean 3.58%

Location

Total Sugars
(ug/gFW)

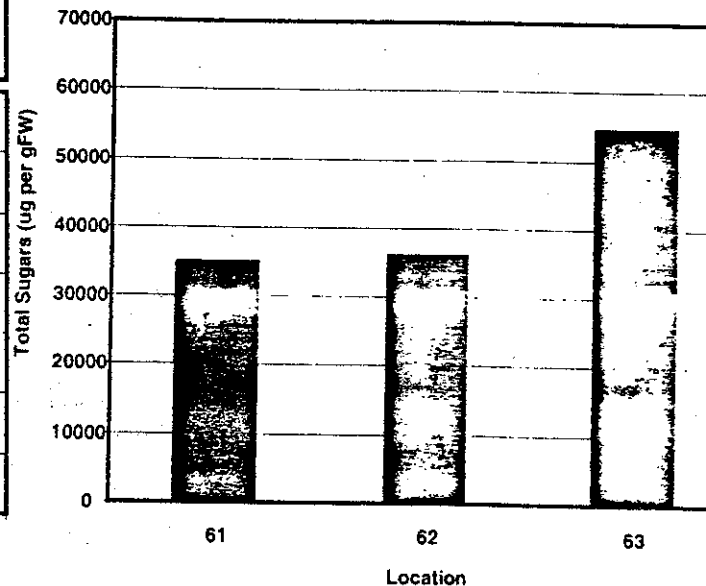
10 - Virginia - UPPT I	43182.0
10 - Virginia - UPPT II	36647.6
20 - North Carolina - Late	40336.7
20 - North Carolina - Early	39437.9
30 - Georgia	29936.9
40 - Alabama	29037.6
50 - Florida	22769.0
61 - Texas, Central	31704.5
62 - Texas, South	33124.5
63 - Texas, West	54808.6
70 - Oklahoma	33152.0



61 - Texas, Central	35224.5
62 - Texas, South	36286.4
63 - Texas, West	54835.6

Tamrun 96

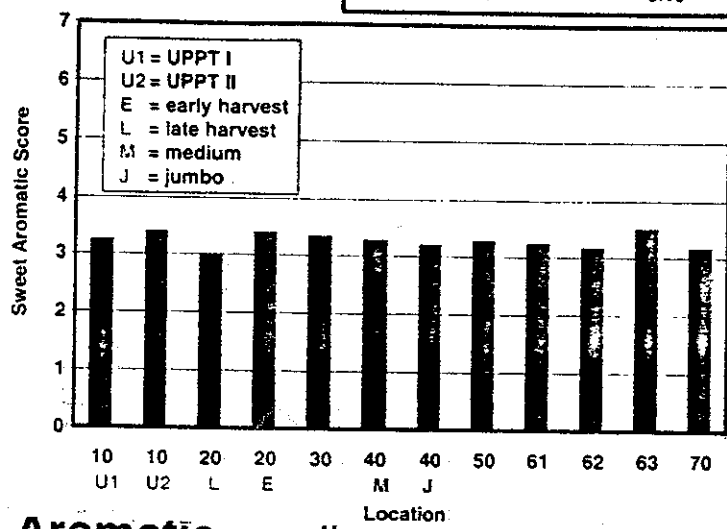
Mean 4.21%



Sweet Aromatic Flavor

TX977053

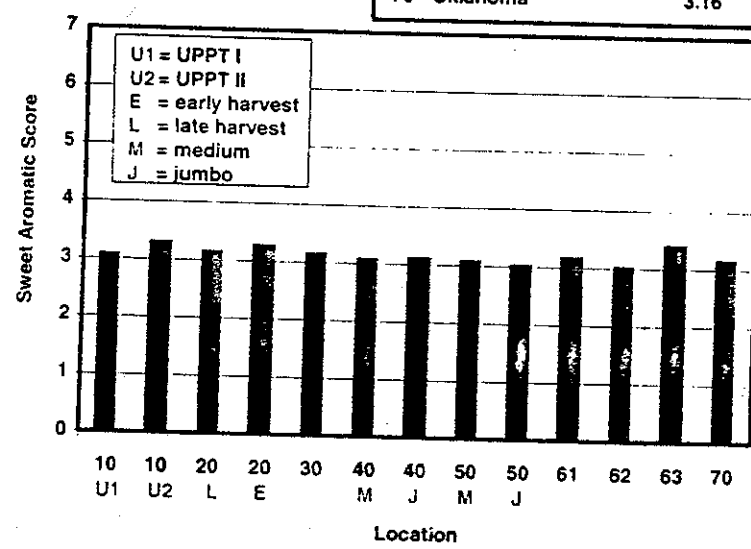
Location	Sweet Aromatic Flavor
10 - Virginia - UPPT I	3.26
10 - Virginia - UPPT II	3.39
20 - North Carolina - Late	3.01
20 - North Carolina - Early	3.40
30 - Georgia	3.34
40 - Alabama - medium	3.29
40 - Alabama - jumbo	3.20
50 - Florida	3.29
61 - Texas, Central	3.26
62 - Texas, South	3.16
63 - Texas, West	3.50
70 - Oklahoma	3.19



Aromatic Flavor

TX977006

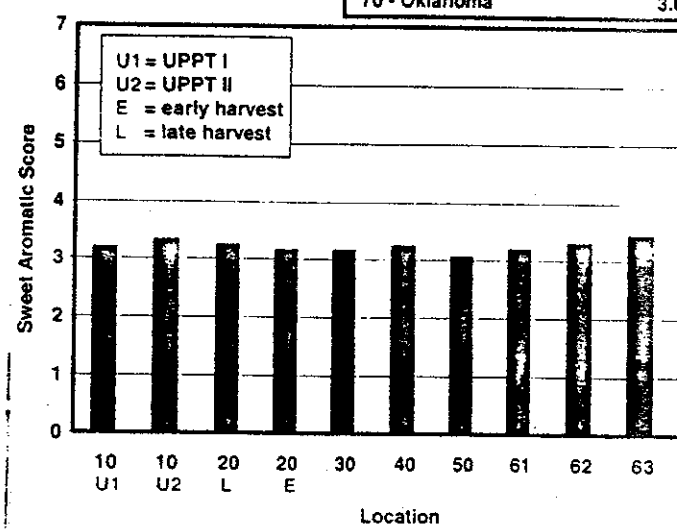
10 - Virginia - UPPT I	3.10
10 - Virginia - UPPT II	3.30
20 - North Carolina - Late	3.17
20 - North Carolina - Early	3.28
30 - Georgia	3.17
40 - Alabama - medium	3.09
40 - Alabama - jumbo	3.13
50 - Florida - medium	3.10
50 - Florida - jumbo	3.03
61 - Texas, Central	3.18
62 - Texas, South	3.04
63 - Texas, West	3.40
70 - Oklahoma	3.16



Sweet Aromatic Flavor

Florunner

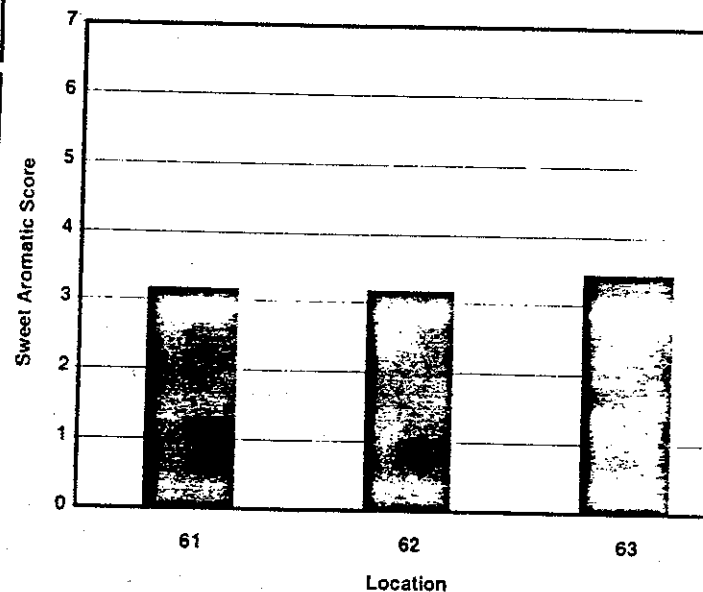
Location	Sweet Aromatic Flavor
10 - Virginia - UPPT I	3.26
10 - Virginia - UPPT II	3.39
20 - North Carolina - Late	3.01
20 - North Carolina - Early	3.40
30 - Georgia	3.34
40 - Alabama	3.29
50 - Florida	3.29
61 - Texas, Central	3.26
62 - Texas, South	3.16
63 - Texas, West	3.50
70 - Oklahoma	3.19



Flavor

Tamrun 96

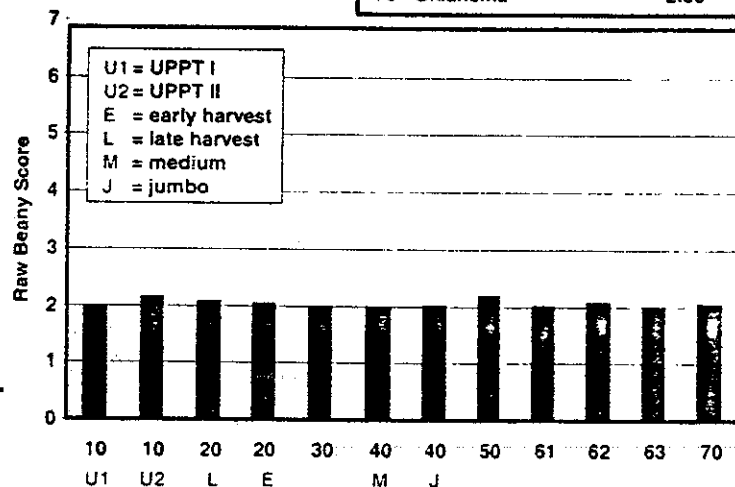
61 - Texas, Central	3.16
62 - Texas, South	3.17
63 - Texas, West	3.46



Raw Beany Flavor

Location	Raw Beany Flavor
10 - Virginia - UPPT I	1.98
10 - Virginia - UPPT II	2.14
20 - North Carolina - Late	2.07
20 - North Carolina - Early	2.03
30 - Georgia	2.00
40 - Alabama - medium	2.00
40 - Alabama - jumbo	2.02
50 - Florida	2.18
61 - Texas, Central	2.01
62 - Texas, South	2.06
63 - Texas, West	2.00
70 - Oklahoma	2.05

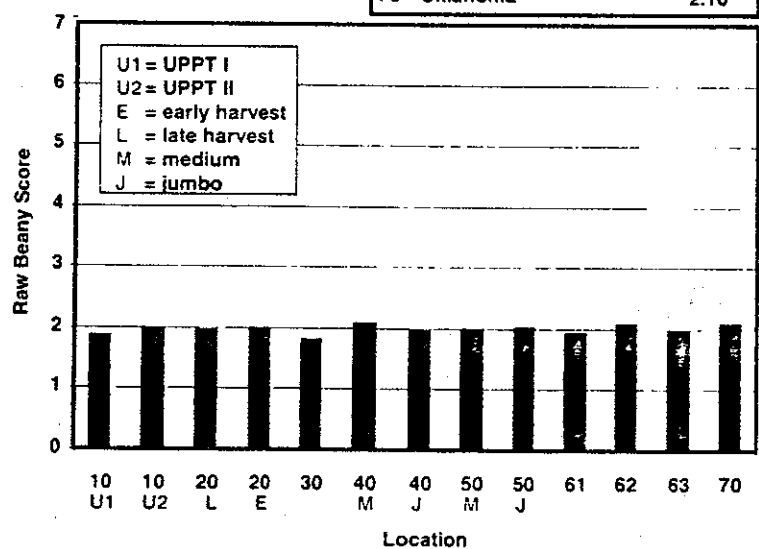
TX977053



Beany Flavor

TX977006

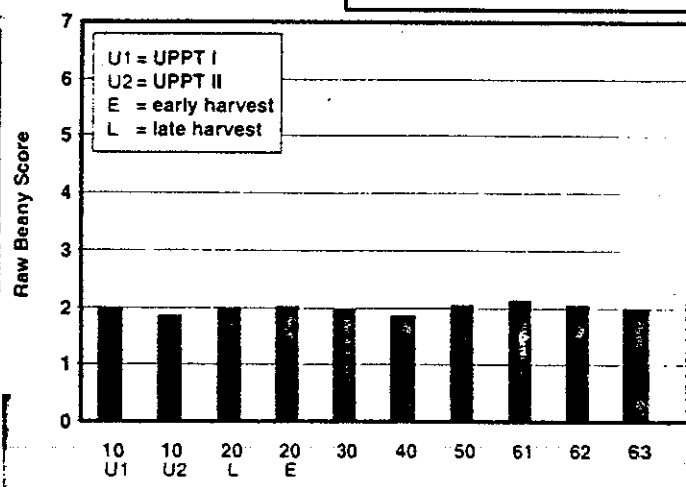
Location	Raw Beany Score
10 - Virginia - UPPT I	1.89
10 - Virginia - UPPT II	2.00
20 - North Carolina - Late	1.97
20 - North Carolina - Early	1.99
30 - Georgia	1.81
40 - Alabama - medium	2.10
40 - Alabama - jumbo	1.98
50 - Florida - medium	2.00
50 - Florida - jumbo	2.04
61 - Texas, Central	1.94
62 - Texas, South	2.09
63 - Texas, West	1.96
70 - Oklahoma	2.10



Raw Beany Flavor

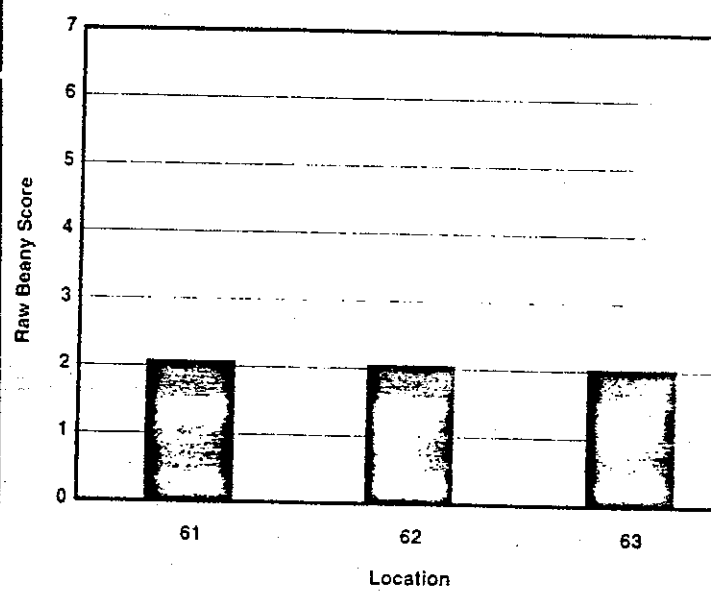
Florunner

Location	Raw Beany Flavor
10 - Virginia - UPPT I	2.00
10 - Virginia - UPPT II	1.80
20 - North Carolina - Late	2.00
20 - North Carolina - Early	2.03
30 - Georgia	1.97
40 - Alabama	1.80
50 - Florida	2.00
61 - Texas, Central	2.10
62 - Texas, South	2.05
63 - Texas, West	2.00
70 - Oklahoma	2.15



Beany Flavor

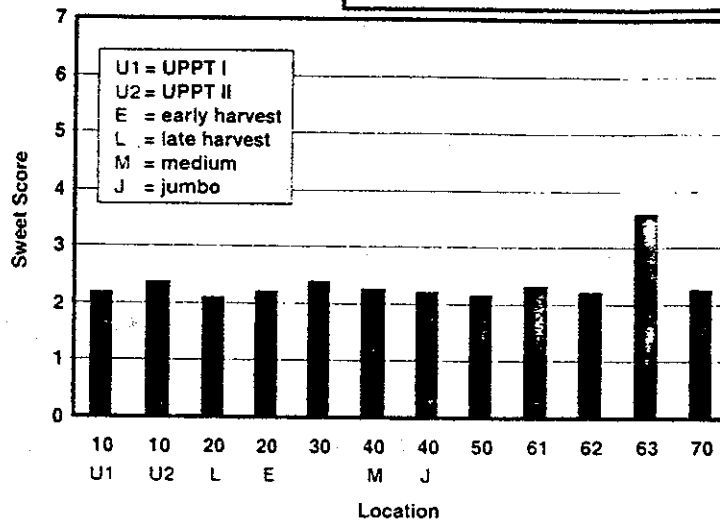
Location	Raw Beany Score
61 - Texas, Central	2.01
62 - Texas, South	2.05
63 - Texas, West	2.00



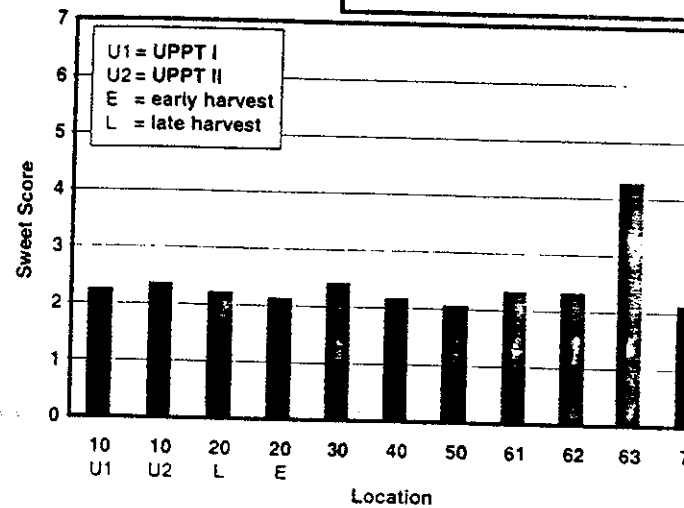
Tamrun 96

Sweet Taste**Location****Sweet Taste****TX977053**

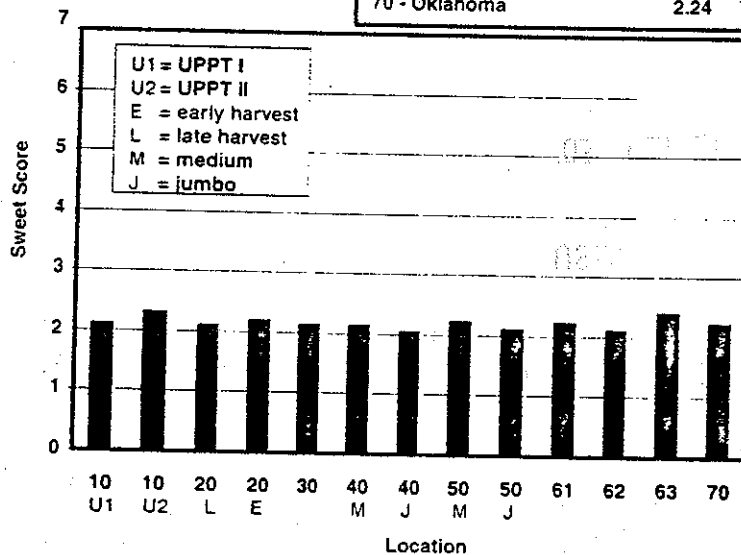
10 - Virginia - UPPT I	2.18
10 - Virginia - UPPT II	2.36
20 - North Carolina - Late	2.11
20 - North Carolina - Early	2.22
30 - Georgia	2.40
40 - Alabama - medium	2.28
40 - Alabama - jumbo	2.20
50 - Florida	2.16
61 - Texas, Central	2.33
62 - Texas, South	2.21
63 - Texas, West	3.60
70 - Oklahoma	2.26

**Sweet Taste****Location****Sweet Taste****Florunner**

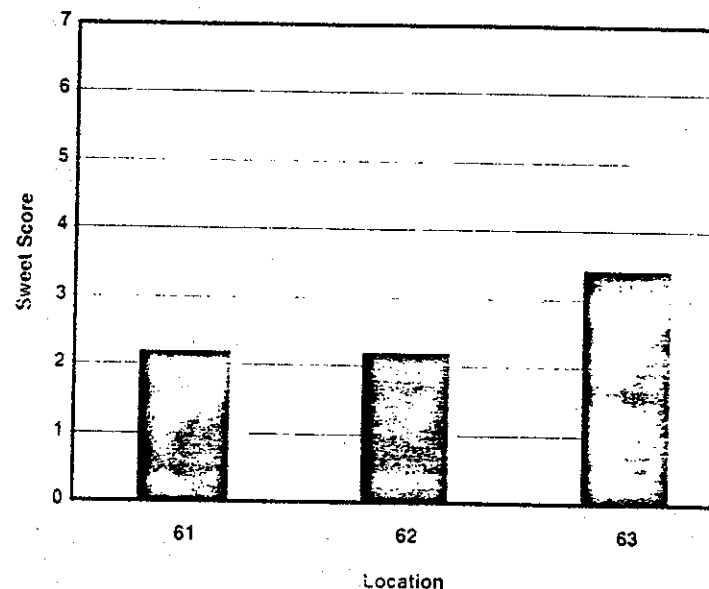
10 - Virginia - UPPT I	2.2
10 - Virginia - UPPT II	2.3
20 - North Carolina - Late	2.2
20 - North Carolina - Early	2.1
30 - Georgia	2.4
40 - Alabama	2.1
50 - Florida	2.0
61 - Texas, Central	2.3
62 - Texas, South	2.3
63 - Texas, West	4.2
70 - Oklahoma	2.1

**TX977006**

10 - Virginia - UPPT I	2.11
10 - Virginia - UPPT II	2.31
20 - North Carolina - Late	2.13
20 - North Carolina - Early	2.21
30 - Georgia	2.14
40 - Alabama - medium	2.15
40 - Alabama - jumbo	2.06
50 - Florida - medium	2.22
50 - Florida - jumbo	2.11
61 - Texas, Central	2.23
62 - Texas, South	2.11
63 - Texas, West	2.40
70 - Oklahoma	2.24

**Tamrun 96**

61 - Texas, Central	2.1
62 - Texas, South	2.1
63 - Texas, West	3.4



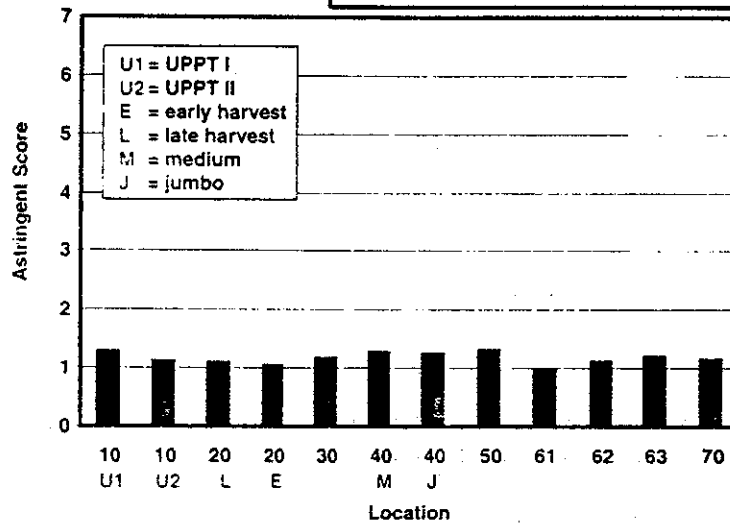
Astringent Taste

TX977053

Location

Astringent
Taste

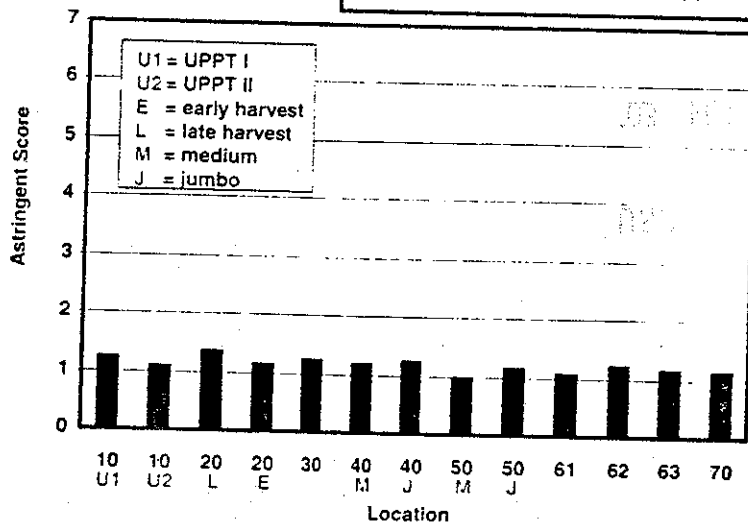
10 - Virginia - UPPT I	1.29
10 - Virginia - UPPT II	1.14
20 - North Carolina - Late	1.11
20 - North Carolina - Early	1.06
30 - Georgia	1.19
40 - Alabama - medium	1.29
40 - Alabama - jumbo	1.26
50 - Florida	1.31
61 - Texas, Central	1.00
62 - Texas, South	1.13
63 - Texas, West	1.22
70 - Oklahoma	1.16



Taste

TX977006

10 - Virginia - UPPT I	1.25
10 - Virginia - UPPT II	1.11
20 - North Carolina - Late	1.37
20 - North Carolina - Early	1.17
30 - Georgia	1.26
40 - Alabama - medium	1.19
40 - Alabama - jumbo	1.24
50 - Florida - medium	1.00
50 - Florida - jumbo	1.16
61 - Texas, Central	1.09
62 - Texas, South	1.23
63 - Texas, West	1.16
70 - Oklahoma	1.14



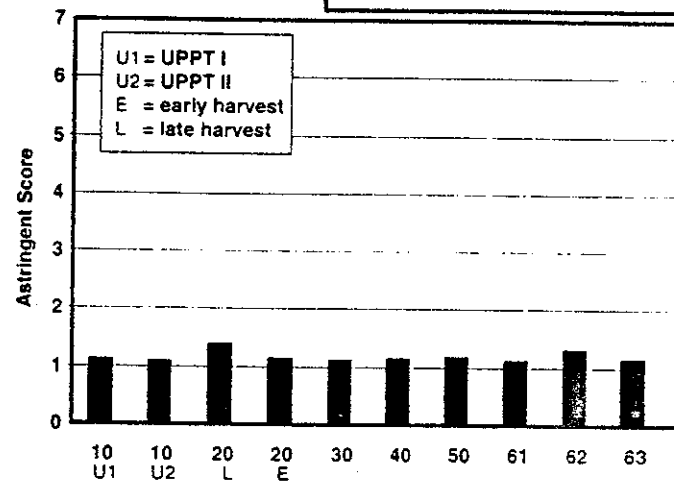
Astringent Taste

Florunner

Location

Astringent
Taste

10 - Virginia - UPPT I	1.1
10 - Virginia - UPPT II	1.0
20 - North Carolina - Late	1.4
20 - North Carolina - Early	1.1
30 - Georgia	1.1
40 - Alabama	1.1
50 - Florida	1.1
61 - Texas, Central	1.1
62 - Texas, South	1.3
63 - Texas, West	1.1
70 - Oklahoma	1.0

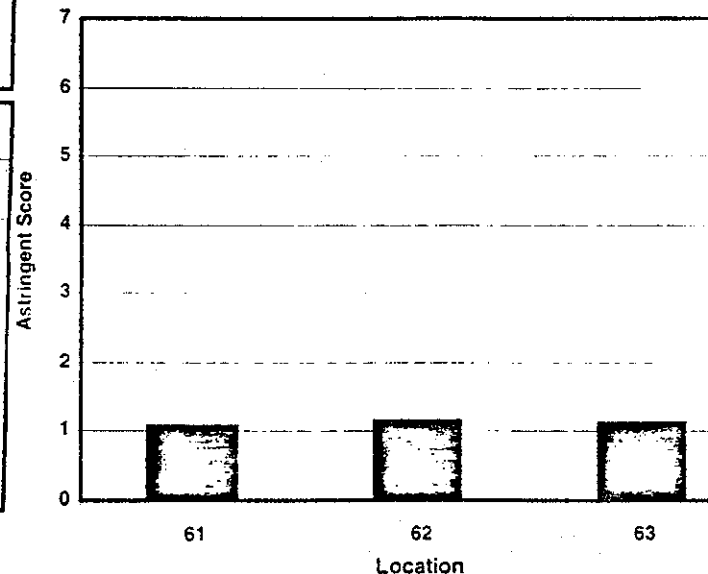


Taste

Tamrun 96

Location

61 - Texas, Central	1.10
62 - Texas, South	1.17
63 - Texas, West	1.13



The GLM Procedure

200300170

Duncan's Multiple Range Test for ~~Y=END~~ *Sugar*

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 32
 Error Mean Square 31066112
 Harmonic Mean of Cell Sizes 10.76923

NOTE: Cell sizes are not equal.

Number of Means	2	3	4
Critical Range	4893	5142	5305

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	44891	6	TR96
A			
B A	40107	15	TROL01
B			
B C	37667	14	FLO
C			
C	34563	15	7053

7053 SUGAR

18:34 Sunday, July 28, 2002

Analysis for data in Table E.

The GLM Procedure

Duncan's Multiple Range Test for ~~Y=END~~ *Sugar*

NOTE: This test controls the Type I comparisonwise error rate, not the experimentwise error rate.

Alpha 0.05
 Error Degrees of Freedom 8
 Error Mean Square 816666.7

Number of Means	2	3	4	5
Critical Range	1702	1773	1813	1837

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	52333.3	3	TROL01
B	49000.0	3	FLVRU
B			
C B	47666.7	3	TR96
C			
C	46333.3	3	7053
D	44333.3	3	FLO

LOCATION 61 UPPT 2001 POD BULK DENSITY TABLE

FLORUNNER

BULK	Kg	cm	Kg/m ³
DENSITY	7.48	30.5	264.02

GA962533

BULK	Kg	cm	Kg/m ³
DENSITY	6.82	30.5	240.67

TP301-1-8

BULK	Kg	cm	Kg/m ³
DENSITY	7.20	29.1	266.64

TX977053

BULK	Kg	cm	Kg/m ³
DENSITY	7.36	30.5	260.05

UF98511

BULK	Kg	cm	Kg/m ³
DENSITY	7.30	30.0	262.04

NC7

BULK	Kg	cm	Kg/m ³
DENSITY	6.46	30.5	227.98

TAMRUN 96

BULK	Kg	cm	Kg/m ³
DENSITY	7.27	29.0	269.77

GA942516

BULK	Kg	cm	Kg/m ³
DENSITY	6.80	30.5	240.03

GA962569

BULK	Kg	cm	Kg/m ³
DENSITY	7.33	30.0	262.95

TX977006

BULK	Kg	cm	Kg/m ³
DENSITY	6.82	30.5	240.96

UF98326

BULK	Kg	cm	Kg/m ³
DENSITY	7.25	29.0	269.40

UF97102

BULK	Kg	cm	Kg/m ³
DENSITY	7.01	30.5	247.72

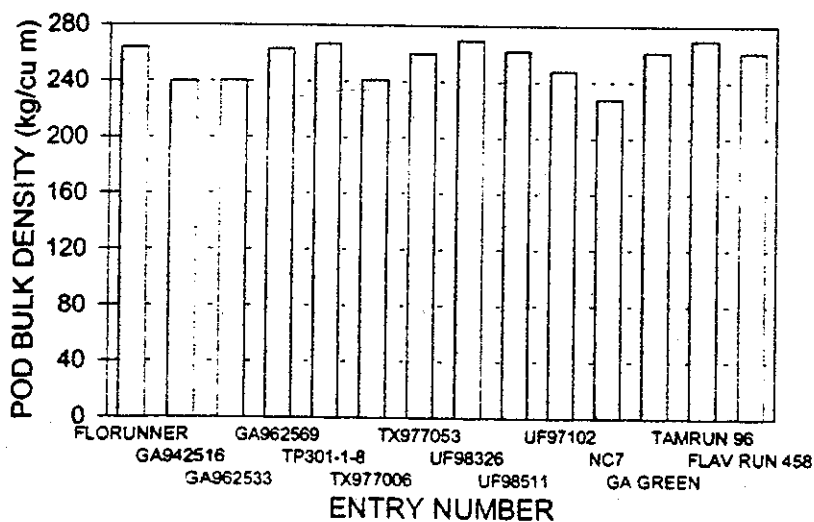
GA GREEN

BULK	Kg	cm	Kg/m ³
DENSITY	7.39	30.5	261.00

FLAVOR RUNNER 458

BULK	Kg	cm	Kg/m ³
DENSITY	7.28	30.0	261.13

LOCATION 61 POD BULK DENSITY



LOCATION 62 UPPT 2001 POD BULK DENSITY TABLE

FLORUNNER

BULK	Kg	cm	Kg/m ³
DENSITY	6.90	24.7	300.64

GA962533

BULK	Kg	cm	Kg/m ³
DENSITY	6.90	26.0	285.74

TP301-1-8

BULK	Kg	cm	Kg/m ³
DENSITY	6.87	25.0	295.97

TX977053

BULK	Kg	cm	Kg/m ³
DENSITY	6.84	24.4	301.57

UF98511

BULK	Kg	cm	Kg/m ³
DENSITY	6.86	23.5	314.18

NC7

BULK	Kg	cm	Kg/m ³
DENSITY	6.93	27.5	270.97

GA942516

BULK	Kg	cm	Kg/m ³
DENSITY	6.83	24.5	300.60

GA962569

BULK	Kg	cm	Kg/m ³
DENSITY	6.90	25.7	289.01

TX977006

BULK	Kg	cm	Kg/m ³
DENSITY	6.89	24.5	302.82

UF98326

BULK	Kg	cm	Kg/m ³
DENSITY	6.90	23.1	321.72

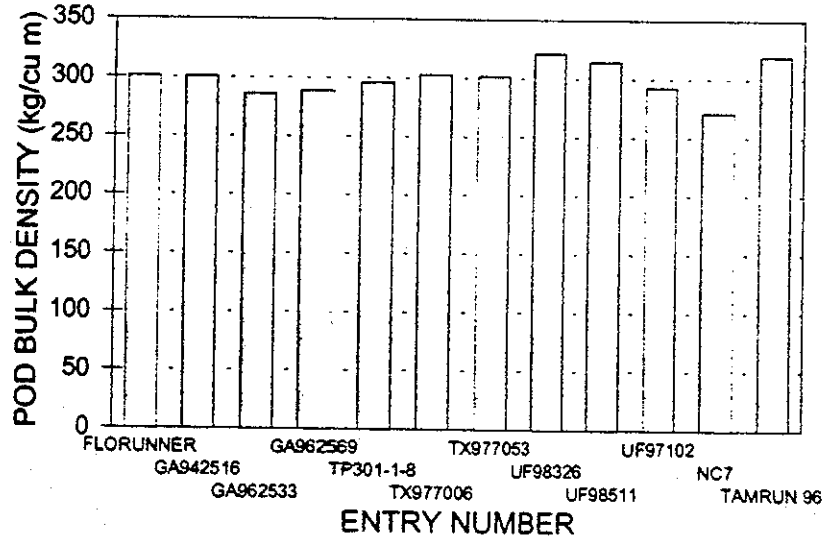
UF97102

BULK	Kg	cm	Kg/m ³
DENSITY	6.88	25.3	292.57

TAMRUN 96

BULK	Kg	cm	Kg/m ³
DENSITY	6.88	23.2	319.23

LOCATION 62 POD BULK DENSITY



LOCATION 63 UPPT 2001 POD BULK DENSITY TABLE

FLORUNNER

BULK	Kg	cm	Kg/m ³
DENSITY	7.22	28.5	273.20

GA962533

BULK	Kg	cm	Kg/m ³
DENSITY	7.03	30.5	248.17

TP301-1-8

BULK	Kg	cm	Kg/m ³
DENSITY	7.13	26.7	287.15

TX977053

BULK	Kg	cm	Kg/m ³
DENSITY	7.14	28.9	266.04

UF98511

BULK	Kg	cm	Kg/m ³
DENSITY	7.22	28.8	270.39

NC7

BULK	Kg	cm	Kg/m ³
DENSITY	6.58	30.5	232.49

GA942516

BULK	Kg	cm	Kg/m ³
DENSITY	5.17	28.2	197.16

GA962569

BULK	Kg	cm	Kg/m ³
DENSITY	7.21	28.8	269.56

TX977006

BULK	Kg	cm	Kg/m ³
DENSITY	7.29	29.5	266.06

UF98326

BULK	Kg	cm	Kg/m ³
DENSITY	6.92	27.2	274.18

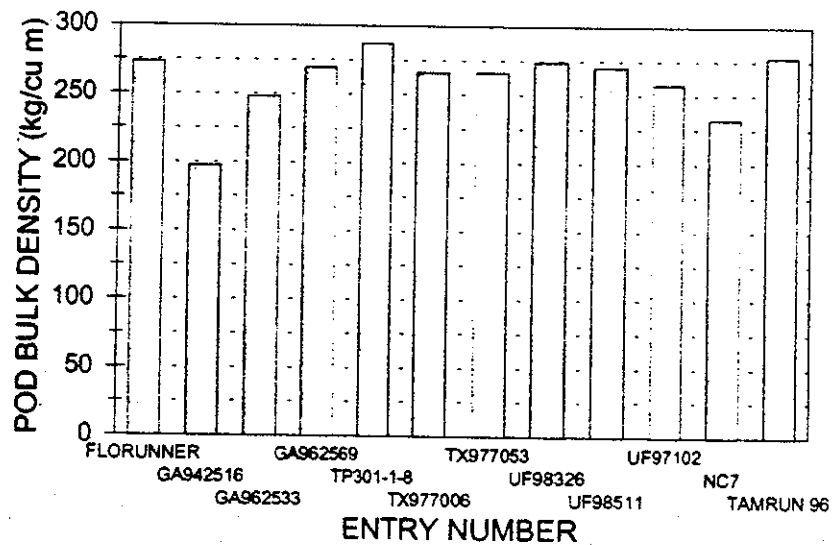
UF97102

BULK	Kg	cm	Kg/m ³
DENSITY	6.72	28.0	257.92

TAMRUN 96

BULK	Kg	cm	Kg/m ³
DENSITY	7.10	27.5	277.77

LOCATION 63 POD BULK DENSITY



Appendix IV

Yield, Grade, Value/Acre, and Disease Evaluation Data

The following pages in Appendix IV are examples of the more than 70 different analyses we conducted on Yield, grade and value per acre data from four years of testing on **Tx977053**.

Similar types of analyses were conducted on the disease evaluation data collected in four years testing on **Tx977053**.

General Linear Models Procedure

200300170

Duncan's Multiple Range Test for variable: YIELD

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 40 MSE= 180907.3

Number of Means 2 3
 Critical Range 265.3 278.9

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	4767.0	21	TROLO1
A			
A	4738.5	21	TROLO2
B	4314.4	21	FLO

7053 RELEASE

11:43 Tuesday, July 2, 2002

General Linear Models Procedure

Dependent Variable: YIELD

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	111830020.66666600	5083182.75757575	28.10	0.000
Error	40	236293.33333360	180907.33333334		
Corrected Total	62	119066314.00000000			

R-Square

C.V.

Root MSE

YIELD Mean

0.939225

9.232967

425.33202717

4606.66666667

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	2698740.66666666	1349370.33333333	7.46	0.0018
LOC	20	109131279.99999900	5456564.00000000	30.16	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	2698740.66666666	1349370.33333333	7.46	0.0018
LOC	20	109131279.99999900	5456564.00000000	30.16	0.0001

General Linear Models Procedure

200300170

TSMK

Duncan's Multiple Range Test for variable: ~~YIELD~~

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 40 MSE= 3.811238

Number of Means 2 3

Critical Range 1.218 1.280

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	71.6810	21	FLO
A			
A	70.9286	21	TROLO1
B	69.4048	21	TROLO2

7053 RELEASE

10:53 Tuesday, July 2, 2002 4

General Linear Models Procedure

Dependent Variable: ~~YIELD~~ TSMK

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	852.49904762	38.74995671	10.17	0.0001
Error	40	152.44952381	3.81123810		
Corrected Total	62	1004.94857143			

R-Square

C.V.

Root MSE

YIELD Mean

0.848301

2.762417

1.95223925

70.67142857

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	56.48380952	28.24190476	7.41	0.0018
LOC	20	796.01523810	39.80076190	10.44	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	56.48380952	28.24190476	7.41	0.0018
LOC	20	796.01523810	39.80076190	10.44	0.0001

General Linear Models Procedure

200300170

Duncan's Multiple Range Test for variable: ~~YIELD~~ 100 sd wt g

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 40 MSE= 7.476659

Number of Means 2 3
Critical Range 1.705 1.793

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	73.4952	21	TROL01
B	64.7238	21	TROL02
C	59.8286	21	FLO

7053 RELEASE

10:56 Tuesday, July 2, 2002

General Linear Models Procedure

Dependent Variable: ~~YIELD~~ 100 sd wt g

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	3274.37777778	148.93535354	19.91	0.0001
Error	40	299.06634921	7.47665873		
Corrected Total	62	3573.44412698			

R-Square

0.916309

C.V.

4.141955

Root MSE

2.73434795

YIELD Mean

66.01587302

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	2013.75365079	1006.87682540	134.67	0.0001
LOC	20	1260.62412698	63.03120635	8.43	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	2013.75365079	1006.87682540	134.67	0.0001
LOC	20	1260.62412698	63.03120635	8.43	0.0001

200300170

General Linear Models Procedure

Duncan's Multiple Range Test for variable

YIELD

NOTE: This test controls the type I comparisonwise error rate, not the experimentwise error rate

Alpha= 0.05 df= 40 MSE= 20245.44

Number of Means 2 3

Critical Range 88.75 93.31

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	T
A	1459.71	21	TROL01
A			
B	1425.14	21	TROL02
B			
B	1343.57	21	FLO

7053 RELEASE

10:49 Tuesday, July 2, 2002

General Linear Models Procedure

Dependent Variable: ~~YIELD~~

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	22	11718058.09523800	532639.00432900	26.31	0.0001
Error	40	809817.61904763	20245.44047619		
Corrected Total	62	12527875.71428570			

R-Square

C.V.

Root MSE

YIELD Mean

0.935359

10.09499

142.28647327

1409.47619048

Source	DF	Type I SS	Mean Square	F Value	Pr > F
T	2	149367.71428571	74683.85714286	3.69	0.0339
LOC	20	11568690.38095230	578434.51904762	28.57	0.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
T	2	149367.71428571	74683.85714286	3.69	0.0339
LOC	20	11568690.38095230	578434.51904762	28.57	0.0001

TSWV

1998

South Texas	Disease Index mean
Tamrun 96	5.0 ns
Florunner	4.0
Tamrun OL01	5.0
Tx977053	5.7

1999

South Texas <u>Neal</u>	TSWV index	Rust index	Southern blight
Tx977053	4.0 ns	6.0 ns	
Tamrun OL01	5.0	5.3	
Tamrun 96	4.3	5.8	
Florunner	3.5	5.8	
<u>Phillips</u>			
Florunner	3.0 ns	5.3 ns	8.8 ns
Tx977053	2.0	5.2	3.7
Tamrun OL01	2.8	5.0	10.3
Tamrun 96	1.8	4.8	5.1

2000

<u>Phillips</u>	TSWV % infection
Florunner	10.8 b*
Tx977053	4.9 b
Tamrun OL01	2.9 b
Tamrun 96	0 a
Flav. Run. 458	2.9 b

2001

South Texas <u>Phillips</u>	TSWV index	Rust
Tamrun OL01	5.25 a*	5.75 ns
Tx977053	4.75 a	5.0
Tamrun 96	4.75 a	5.5
Florunner	6.25 ab	5.25
Flv. Ru. 458	6.75 b	5.25

*Means in the same column followed by the same letter are not significantly different, DMRT (0.05).

Disease ratings for Tx977053 2000 – 2001

SCLEROTINIA

2000	OK ALT	Steph. ALT
	% inf. plts	index (1 to 10)
Tx977006	13 ns	8.7 ab*
Florunner	20	10 b
Flav. Runner	23	9.3 b
Tx977053	7	9.0 ab
Tamrun 96	7	8.3 ab
GA. Green	8	9.3 b
Tamrun 98	9	6.7 a

2001

Oklahoma

	Test 1	Test 2	Test 3	Test 4
	% infected plants			
Tamrun OL01	19.0 ?	18.2 ns	25.8 ab*	33.0 ab*
Tx977053	30.0	20.0	40.4 c	42.8 bc
Tamrun 96	15.0	14.8	18.2 a	27.8 a
Florunner or Okrun	36.5	23.4	38.6 bc	51.8 c
Flv. Run. 458	49.5		45.6 c	

Stephenville

	Sclerotinia Disease index
Tamrun OL01	5.75 ns
Tx977053	4.75
Tamrun 96	4.25
Florunner	4.50
Flav. Ru. 458	6.00

? Statistics not available, only means.

*Means in the same column followed by the same letter are not significantly different, DMRT (0.05).

Overall comparison of Tx977053 to Flavor Runner 458 for yield under disease pressure and Without disease pressure.

	Seven tests with Disease pressure	Nine tests without Disease pressure
Tx977053	4784 a*	3985 a
Flavor Runner 458	3476 b	3769 a

* Means within columns with the same letter are not significantly different, DMRT (0.05).

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E

STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) Texas Agricultural Experiment Station	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER Tx977053	3. VARIETY NAME Tamrun OL 02
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) Office of the Director, TAES 2147 TAMU College Station, TX 77843-2147	5. TELEPHONE (Include area code) 979-845-4747	6. FAX (Include area code) 979-458-4765
7. PVPO NUMBER 200300170		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain

☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. National or a U.S. based company? If no, give name of country

☒ YES ☐ NO
10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES ☐ NO If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (If needed, use the reverse for extra space):

TAES policy and handbook manual provide that all germplasm and varieties developed by its employees in the course of their duties are owned by TAES. A copy of this policy is provided for your records.

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 6 minutes per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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